# WORLDWIDE PDB PROTEIN DATA BANK

# Full wwPDB EM Validation Report ⓘ

Mar 15, 2026 – 04:25 PM JST

| | | |
|---|---|---|
| PDB ID | : | 21TP / pdb_000021tp |
| EMDB ID | : | EMD-67990 |
| Title | : | Open-state structure of veratridine-activated human Nav1.7 |
| Authors | : | Fan, X.; Huang, J.; Yan, N. |
| Deposited on | : | 2025-12-24 |
| Resolution | : | 3.00 Å(reported) |

This is a Full wwPDB EM 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/EMValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

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The following versions of software and data (see references ⓘ) were used in the production of this report:

| | | |
|---|---|---|
| EMDB validation analysis | : | 0.0.1.dev132 |
| Mogul | : | 1.8.5 (274361), CSD as541be (2020) |
| MolProbity | : | 4-5-2 with Phenix2.0 |
| buster-report | : | 1.1.7 (2018) |
| Percentile statistics | : | 20231227.v01 (using entries in the PDB archive December 27th 2023) |
| EM percentile statistics | : | 202505.v01 (Using data in the EMDB archive up until May 2025) |
| MapQ | : | 1.9.13 |
| Ideal geometry (proteins) | : | Engh & Huber (2001) |
| Ideal geometry (DNA, RNA) | : | Parkinson et al. (1996) |
| Validation Pipeline (wwPDB-VP) | : | 2.48.1 |

# 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.

| Metric | Percentile Ranks | Value |
|---|---|---|
| Clashscore | | 6 |
| Ramachandran outliers | | 0 |
| Sidechain outliers | | 0.1% |

*Worse*                    *Better*

▮ Percentile relative to all structures
▯ Percentile relative to all EM structures

| Metric | Model-Map Fit Percentile Ranks | Value |
|---|---|---|
| Q-score | | 0.467 |

*Worse*                    *Better*

▮ Percentile relative to all EM structures
▯ Percentile relative to EM structures of similar resolution
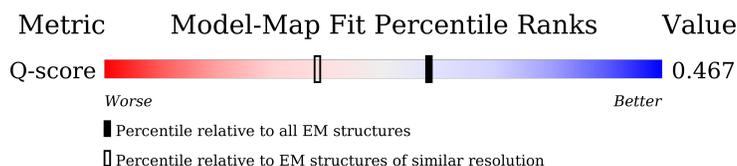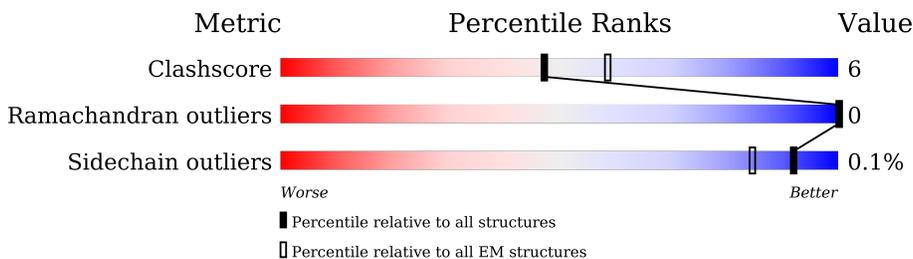
| Metric | Whole archive (#Entries) | EM structures (#Entries) | Similar EM resolution (#Entries, resolution range(Å)) |
|---|---|---|---|
| Clashscore | 210492 | 15764 | - |
| Ramachandran outliers | 207382 | 16835 | - |
| Sidechain outliers | 206894 | 16415 | - |
| Q-score | - | 25397 | 14081 ( 2.50 - 3.50 ) |

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 of the bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion < 40%). The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain |
|---|---|---|---|
| 1 | A | 1988 | 52%    7%    41% |
| 2 | B | 173 | 88%    12% |
| 3 | C | 119 | 61%  82%    18% |
| 4 | D | 2 | 100% |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 4 | E | 2 | 100% |

# 2 Entry composition ⓘ

There are 9 unique types of molecules in this entry. The entry contains 12524 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 Sodium channel protein type 9 subunit alpha.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Total | C | N | O | S | | |
| 1 | A | 1180 | 9514 | 6324 | 1485 | 1631 | 74 | 0 | 0 |

- Molecule 2 is a protein called Sodium channel regulatory subunit beta-1.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Total | C | N | O | S | | |
| 2 | B | 173 | 1417 | 902 | 232 | 273 | 10 | 0 | 0 |

- Molecule 3 is a protein called Sodium channel regulatory subunit beta-2.

| Mol | Chain | Residues | Atoms | | | | | AltConf | Trace |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Total | C | N | O | S | | |
| 3 | C | 119 | 975 | 611 | 172 | 181 | 11 | 0 | 0 |

- Molecule 4 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-a cetamido-2-deoxy-beta-D-glucopyranose.
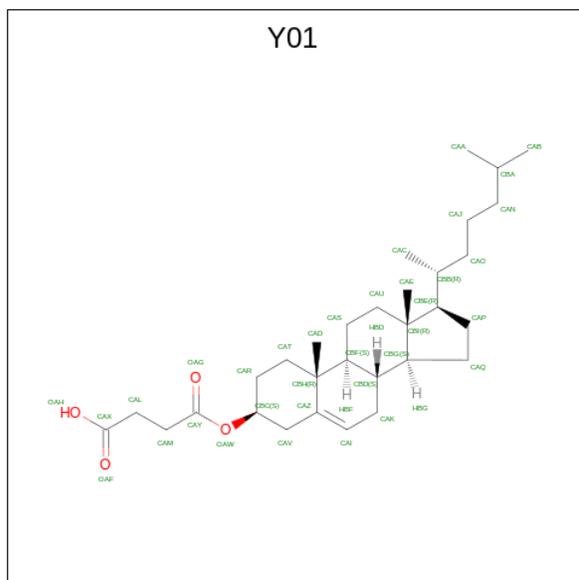


| Mol | Chain | Residues | Atoms | | | | AltConf | Trace |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Total | C | N | O | | |
| 4 | D | 2 | 28 | 16 | 2 | 10 | 0 | 0 |
| 4 | E | 2 | 28 | 16 | 2 | 10 | 0 | 0 |

- Molecule 5 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: $C_8H_{15}NO_6$).

| Mol | Chain | Residues | Atoms | | | | AltConf |
|---|---|---|---|---|---|---|---|
| 5 | A | 1 | Total | C | N | O | 0 |
| | | | 14 | 8 | 1 | 5 | |
| 5 | A | 1 | Total | C | N | O | 0 |
| | | | 14 | 8 | 1 | 5 | |
| 5 | A | 1 | Total | C | N | O | 0 |
| | | | 14 | 8 | 1 | 5 | |
| 5 | B | 1 | Total | C | N | O | 0 |
| | | | 14 | 8 | 1 | 5 | |
| 5 | B | 1 | Total | C | N | O | 0 |
| | | | 14 | 8 | 1 | 5 | |
| 5 | B | 1 | Total | C | N | O | 0 |
| | | | 14 | 8 | 1 | 5 | |

- Molecule 6 is CHOLESTEROL HEMISUCCINATE (CCD ID: Y01) (formula: $C_{31}H_{50}O_4$).

Y01

| Mol | Chain | Residues | Atoms | | | AltConf |
|-----|-------|----------|-------|---|---|---------|
| 6 | A | 1 | Total | C | O | 0 |
| | | | 35 | 31 | 4 | |
| 6 | A | 1 | Total | C | O | 0 |
| | | | 35 | 31 | 4 | |
| 6 | A | 1 | Total | C | O | 0 |
| | | | 35 | 31 | 4 | |
| 6 | A | 1 | Total | C | O | 0 |
| | | | 35 | 31 | 4 | |

- Molecule 7 is 1-O-OCTADECYL-SN-GLYCERO-3-PHOSPHOCHOLINE (CCD ID: LPE) (formula: $C_{26}H_{57}NO_6P$).
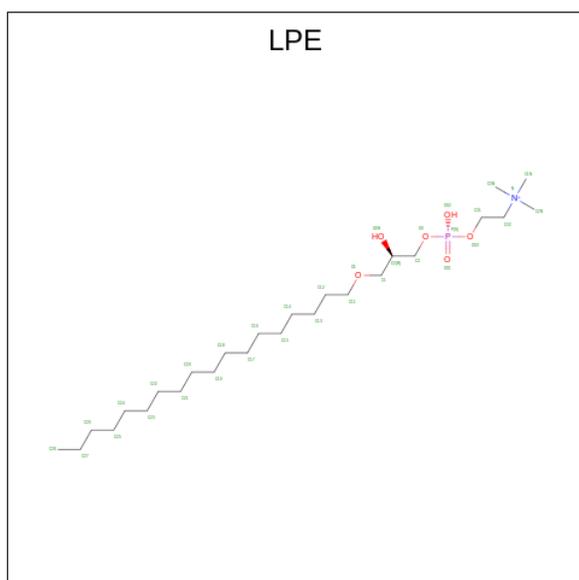


LPE

| Mol | Chain | Residues | Atoms | | | | | AltConf |
|---|---|---|---|---|---|---|---|---|
| 7 | A | 1 | Total 25 | C 17 | N 1 | O 6 | P 1 | 0 |
| 7 | A | 1 | Total 25 | C 17 | N 1 | O 6 | P 1 | 0 |
| 7 | A | 1 | Total 22 | C 14 | N 1 | O 6 | P 1 | 0 |
| 7 | A | 1 | Total 28 | C 20 | N 1 | O 6 | P 1 | 0 |
| 7 | A | 1 | Total 25 | C 17 | N 1 | O 6 | P 1 | 0 |
| 7 | A | 1 | Total 25 | C 17 | N 1 | O 6 | P 1 | 0 |
| 7 | A | 1 | Total 25 | C 17 | N 1 | O 6 | P 1 | 0 |
| 7 | B | 1 | Total 17 | C 9 | N 1 | O 6 | P 1 | 0 |

- Molecule 8 is 1,2-DIOLEOYL-SN-GLYCERO-3-PHOSPHOCHOLINE (CCD ID: PCW) (formula: $C_{44}H_{85}NO_8P$).



PCW
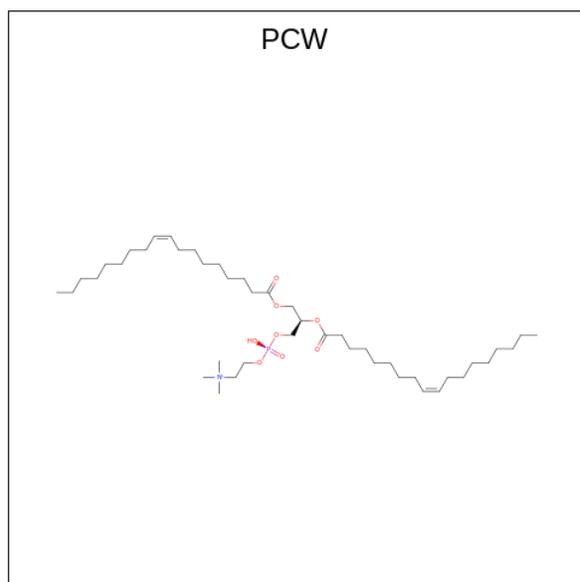
| Mol | Chain | Residues | Atoms | | | | | AltConf |
|---|---|---|---|---|---|---|---|---|
| 8 | A | 1 | Total 51 | C 41 | N 1 | O 8 | P 1 | 0 |
| 8 | A | 1 | Total 47 | C 37 | N 1 | O 8 | P 1 | 0 |

- Molecule 9 is Veratridine (CCD ID: A1E26) (formula: $C_{36}H_{51}NO_{11}$).

A1E26

| Mol | Chain | Residues | Atoms | | | | AltConf |
|-----|-------|----------|-------|-----|-----|-----|---------|
| 9 | A | 1 | Total | C | N | O | 0 |
| | | | 48 | 36 | 1 | 11 | |

# 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: Sodium channel protein type 9 subunit alpha

SER VAL ASP LYS HIS LEU MET GLU ASP SER ASP GLY GLN SER PHE ILE HIS ASN PRO SER LEU THR VAL THR VAL PRO ILE ALA PRO GLY GLU GLU ASP LEU GLU ASN MET ASN ALA GLU GLU LEU SER ASP SER ASP SER GLU TYR SER LYS VAL ARG LEU ASN ARG SER SER

SER GLU CYS SER THR VAL ASP ASN PRO LEU PRO GLY GLU GLU GLU ALA GLU GLU ALA GLU PRO MET ASN SER ASP GLU PRO GLU ALA CYS PHE THR ASP ASP CYS VAL TRP ARG PHE SER CYS CYS GLN VAL ASN ILE GLU SER GLY LYS <span>G1175</span> <span>H1191</span> <span>S1192</span> <span>W1193</span> <span>A1210</span> <span>F1254</span>

<span>A1257</span> <span>W1260</span> ◆<span>S1281</span> ◆<span>D1282</span> <span>L1283</span> <span>L1289</span> <span>L1292</span> <span>G1306</span> <span>V1310</span> <span>V1311</span> <span>N1312</span> <span>A1313</span> <span>L1314</span> ◆<span>I1315</span> <span>C1328</span> <span>L1329</span> <span>I1330</span> <span>I1334</span> <span>N1341</span> <span>Y1348</span> <span>P1365</span> <span>E1369</span> <span>N1384</span> <span>L1385</span> <span>N1388</span> <span>V1402</span> <span>K1406</span> <span>G1407</span> <span>W1408</span> <span>Y1413</span> <span>V1419</span> <span>N1420</span> <span>P1425</span> <span>F1443</span> <span>L1451</span> <span>F1452</span> <span>V1455</span>

<span>K1464</span> LYS LYS LEU GLY GLY GLN ASP ILE PHE MET THR GLU GLU GLN LYS LYS TYR TYR ASN ALA MET LYS LYS LEU GLY SER LYS PRO GLN LYS PRO ILE <span>P1498</span> ◆<span>G1501</span> <span>N1502</span> <span>G1506</span> ◆<span>L1511</span> <span>N1528</span> <span>E1537</span> <span>G1560</span> <span>V1563</span> ◆<span>L1566</span> <span>F1581</span> <span>V1584</span> <span>V1585</span> ◆<span>D1597</span>

◆<span>V1604</span> <span>R1610</span> <span>R1619</span> <span>R1622</span> ◆<span>G1626</span> <span>L1633</span> <span>N1646</span> <span>I1647</span> <span>L1653</span> <span>V1654</span> <span>M1655</span> <span>Y1658</span> <span>F1661</span> <span>V1669</span> <span>K1670</span> <span>K1671</span> <span>I1675</span> <span>F1684</span> <span>G1685</span> <span>I1689</span> <span>C1690</span> <span>I1694</span> <span>A1698</span> <span>L1703</span> <span>C1730</span> <span>F1738</span> <span>Y1739</span> <span>N1762</span> PHE SER VAL ALA THR GLU GLU SER THR GLU PRO LEU SER

GLU ASP ASP PHE GLU MET PHE TYR GLU VAL TRP GLU LYS PHE ASP ASP ALA PRO ALA THR GLN PHE ILE GLU PHE SER LYS LEU SER ASP PHE ALA ALA LEU ASP PRO PRO LEU LEU ILE ALA LYS PRO ASN LYS VAL GLN LEU ILE ALA MET ASP LEU PRO MET VAL SER GLY ASP ARG

ILE HIS CYS LEU ASP ILE LEU PHE ALA PHE THR LYS ARG VAL LEU GLY GLU SER GLU MET ASP SER LEU ARG SER GLN MET GLU GLU ARG PHE MET SER ALA ASN LEU ASP PRO LEU LEU ILE ALA MET ASP LYS PRO ASN LYS VAL GLN LEU ILE ALA MET ASP LEU PRO MET VAL SER GLY ASP ARG VAL

ILE GLN ARG ALA TYR ARG ARG TYR ARG LEU ARG GLN ASN VAL LYS ASN ILE SER SER ILE TYR ILE LYS ASP GLY ASP ARG ASP ASP LEU LEU ASN LYS LYS ASP MET ALA PHE ASP ASN VAL ASN GLU ASN SER SER PRO GLU LYS THR ASP ALA THR SER SER THR THR SER PRO

PRO SER TYR ASP SER VAL THR LYS PRO ASP LYS GLU TYR GLU ASP ARG LEU LYS LEU LYS LYS GLU GLN GLN GLN GLN GLN SER ARG THR LEU LYS LEU GLU ASP LYS GLY LYS ASP SER SER LYS LYS

• Molecule 2: Sodium channel regulatory subunit beta-1

Chain B:    88%    12%

<span>G20</span> <span>S42</span> <span>C43</span> <span>L78</span> <span>R89</span> <span>W92</span> <span>N93</span> <span>R96</span> <span>Q102</span> <span>S105</span> <span>N110</span> <span>Y113</span> <span>S116</span> <span>G117</span> <span>D118</span> <span>R125</span> <span>H143</span> <span>V146</span> <span>V147</span> <span>D148</span> <span>R152</span> ◆<span>D153</span> <span>I157</span> <span>M178</span> <span>T189</span> ◆<span>E190</span> ◆<span>T191</span> ◆<span>A192</span>

• Molecule 3: Sodium channel regulatory subunit beta-2

Chain C:    61%    82%    18%

◆<span>M30</span> ◆<span>E31</span> ◆<span>V32</span> ◆<span>T33</span> ◆<span>V34</span> ◆<span>P35</span> ◆<span>A36</span> ◆<span>T37</span> ◆<span>L38</span> ◆<span>N39</span> ◆<span>V40</span> ◆<span>L41</span> ◆<span>N42</span> ◆<span>G43</span> ◆<span>S44</span> ◆<span>D45</span> ◆<span>A46</span> ◆<span>R47</span> ◆<span>L48</span> ◆<span>P49</span> <span>C50</span> ◆<span>H60</span> <span>K61</span> <span>Q62</span> ◆<span>W67</span> ◆<span>T68</span> ◆<span>Y69</span> ◆<span>Q70</span> ◆<span>E71</span> ◆<span>C72</span> ◆<span>N73</span> ◆<span>N74</span> <span>C75</span> ◆<span>S76</span> ◆<span>E77</span> ◆<span>E78</span> ◆<span>M79</span> <span>F80</span> ◆<span>M85</span> ◆<span>K86</span> ◆<span>I87</span> ◆<span>I88</span> ◆<span>N89</span> ◆<span>L90</span> ◆<span>K91</span> ◆<span>L92</span> ◆<span>E93</span> ◆<span>R94</span> ◆<span>F95</span> ◆<span>Q96</span> ◆<span>D97</span> ◆<span>R98</span> ◆<span>V99</span> ◆<span>E100</span> ◆<span>F101</span> ◆<span>S102</span> ◆<span>G103</span>

<span>N104</span> ◆<span>K107</span> <span>Y108</span> <span>D109</span> ◆<span>V112</span> ◆<span>M113</span> ◆<span>L114</span> <span>R115</span> <span>N116</span> <span>V117</span> <span>Q118</span> <span>P119</span> <span>E120</span> <span>D121</span> <span>E122</span> <span>G123</span> ◆<span>I124</span> ◆<span>C127</span> <span>Y128</span> <span>I129</span> <span>P132</span> ◆<span>H136</span> ◆<span>R137</span> <span>G138</span> ◆<span>H139</span> ◆<span>G140</span> ◆<span>K141</span> ◆<span>I142</span> <span>H143</span> <span>L144</span> <span>Q145</span> <span>V146</span> <span>L147</span> <span>M148</span>

• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain D:    100%

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NAG1
NAG2

• Molecule 4: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-gluc opyranose

Chain E:　　　　　　　　　　　　　　　　　　　100%

NAG1
NAG2

# 4　Experimental information　ⓘ

| Property | Value | Source |
|---|---|---|
| EM reconstruction method | SINGLE PARTICLE | Depositor |
| Imposed symmetry | POINT, POINT, POINT, POINT | Depositor |
| Number of particles used | 133758, 133758, 133758, 133758 | Depositor |
| Resolution determination method | FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF, FSC 0.143 CUT-OFF | Depositor |
| CTF correction method | PHASE FLIPPING AND AMPLITUDE CORRECTION, PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope | TFS KRIOS | Depositor |
| Voltage (kV) | 300 | Depositor |
| Electron dose $(e^-/\text{Å}^2)$ | 50 | Depositor |
| Minimum defocus (nm) | 1200 | Depositor |
| Maximum defocus (nm) | 1600 | Depositor |
| Magnification | Not provided | |
| Image detector | GATAN K2 SUMMIT (4k x 4k) | Depositor |
| Maximum map value | 4.874 | Depositor |
| Minimum map value | -2.849 | Depositor |
| Average map value | -0.006 | Depositor |
| Map value standard deviation | 0.109 | Depositor |
| Recommended contour level | 0.65 | Depositor |
| Map size (Å) | 356.47998, 356.47998, 356.47998 | wwPDB |
| Map dimensions | 320, 320, 320 | wwPDB |
| Map angles (°) | 90.0, 90.0, 90.0 | wwPDB |
| Pixel spacing (Å) | 1.114, 1.114, 1.114 | Depositor |

# 5 Model quality ⓘ

## 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: LPE, NAG, PCW, Y01, A1E26

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).

| Mol | Chain | Bond lengths | | Bond angles | |
|-----|-------|------|---------|------|---------|
| | | RMSZ | #$|Z|$ >5 | RMSZ | #$|Z|$ >5 |
| 1 | A | 0.10 | 0/9749 | 0.26 | 0/13217 |
| 2 | B | 0.09 | 0/1443 | 0.28 | 0/1949 |
| 3 | C | 0.11 | 0/997 | 0.31 | 0/1346 |
| All | All | 0.10 | 0/12189 | 0.27 | 0/16512 |

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts ⓘ

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1 | A | 9514 | 0 | 9729 | 109 | 0 |
| 2 | B | 1417 | 0 | 1380 | 14 | 0 |
| 3 | C | 975 | 0 | 937 | 11 | 0 |
| 4 | D | 28 | 0 | 25 | 2 | 0 |
| 4 | E | 28 | 0 | 25 | 0 | 0 |
| 5 | A | 42 | 0 | 39 | 0 | 0 |
| 5 | B | 42 | 0 | 39 | 0 | 0 |
| 6 | A | 140 | 0 | 196 | 26 | 0 |
| 7 | A | 175 | 0 | 242 | 16 | 0 |
| 7 | B | 17 | 0 | 19 | 3 | 0 |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 8 | A | 98 | 0 | 136 | 14 | 0 |
| 9 | A | 48 | 0 | 0 | 2 | 0 |
| All | All | 12524 | 0 | 12767 | 146 | 0 |

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 6.

All (146) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|--------|--------|--------------------------|-------------------|
| 1:A:1330:ILE:HD11 | 6:A:2005:Y01:HAN1 | 1.37 | 1.06 |
| 1:A:849:TRP:CD1 | 6:A:2005:Y01:HAD3 | 1.91 | 1.05 |
| 2:B:178:MET:HE3 | 7:B:304:LPE:C11 | 1.86 | 1.05 |
| 1:A:1329:LEU:HD23 | 6:A:2016:Y01:HAA3 | 1.47 | 0.96 |
| 2:B:178:MET:CE | 7:B:304:LPE:C11 | 2.51 | 0.88 |
| 1:A:849:TRP:HA | 6:A:2005:Y01:CAD | 2.04 | 0.88 |
| 1:A:759:LEU:HD22 | 6:A:2016:Y01:HAC3 | 1.56 | 0.87 |
| 1:A:1684:PHE:CE2 | 7:A:2014:LPE:O2H | 2.28 | 0.85 |
| 1:A:849:TRP:CD1 | 6:A:2005:Y01:CAD | 2.63 | 0.81 |
| 1:A:1329:LEU:HD23 | 6:A:2016:Y01:CAA | 2.11 | 0.80 |
| 1:A:1330:ILE:CD1 | 6:A:2005:Y01:HAN1 | 2.15 | 0.76 |
| 1:A:849:TRP:HA | 6:A:2005:Y01:HAD1 | 1.69 | 0.74 |
| 1:A:1653:LEU:HD13 | 7:A:2014:LPE:C19 | 2.18 | 0.73 |
| 1:A:848:SER:O | 6:A:2005:Y01:HAR2 | 1.90 | 0.71 |
| 1:A:941:GLN:NE2 | 8:A:2012:PCW:H52 | 2.05 | 0.71 |
| 1:A:336:ASN:HB2 | 1:A:340:GLY:HA2 | 1.72 | 0.71 |
| 1:A:949:MET:HB3 | 8:A:2012:PCW:H232 | 1.74 | 0.70 |
| 1:A:941:GLN:HE22 | 8:A:2012:PCW:H52 | 1.55 | 0.70 |
| 1:A:1330:ILE:HD11 | 6:A:2005:Y01:CAN | 2.20 | 0.68 |
| 1:A:849:TRP:HA | 6:A:2005:Y01:HAD2 | 1.79 | 0.65 |
| 2:B:118:ASP:OD1 | 2:B:143:HIS:ND1 | 2.29 | 0.65 |
| 1:A:1210:ALA:CB | 7:A:2014:LPE:H11 | 2.28 | 0.64 |
| 3:C:98:ARG:NH2 | 3:C:116:ASN:O | 2.28 | 0.64 |
| 1:A:759:LEU:CD2 | 6:A:2016:Y01:HAC3 | 2.29 | 0.63 |
| 1:A:345:ASP:HB2 | 1:A:1537:GLU:HB3 | 1.81 | 0.62 |
| 2:B:92:TRP:O | 2:B:96:ARG:NH2 | 2.32 | 0.62 |
| 1:A:1646:ASN:OD1 | 1:A:1647:ILE:HD12 | 1.99 | 0.62 |
| 1:A:1671:LYS:HG2 | 1:A:1675:ILE:HG22 | 1.82 | 0.61 |
| 1:A:315:CYS:SG | 1:A:316:GLY:N | 2.73 | 0.61 |
| 1:A:111:PRO:O | 1:A:117:ARG:NH1 | 2.34 | 0.60 |
| 1:A:1254:PHE:O | 1:A:1260:TRP:NE1 | 2.32 | 0.60 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 1:A:1328:CYS:HB2 | 1:A:1452:PHE:HZ | 1.65 | 0.60 |
| 1:A:1257:ALA:HB1 | 7:A:2011:LPE:H31 | 1.83 | 0.60 |
| 1:A:1306:GLY:HA3 | 1:A:1646:ASN:HB2 | 1.84 | 0.59 |
| 1:A:1528:ASN:HD21 | 1:A:1619:ARG:HH21 | 1.49 | 0.59 |
| 1:A:271:LEU:HD12 | 1:A:343:SER:HA | 1.85 | 0.59 |
| 1:A:764:GLU:OE2 | 1:A:1341:ASN:ND2 | 2.36 | 0.58 |
| 1:A:74:PRO:HA | 1:A:90:VAL:HG12 | 1.85 | 0.58 |
| 1:A:759:LEU:HD22 | 6:A:2016:Y01:CAC | 2.30 | 0.58 |
| 3:C:104:ASN:N | 3:C:109:ASP:O | 2.34 | 0.58 |
| 9:A:2017:A1E26:O9 | 9:A:2017:A1E26:O11 | 2.22 | 0.56 |
| 1:A:1312:ASN:OD1 | 7:A:2011:LPE:H312 | 2.06 | 0.56 |
| 1:A:1385:LEU:O | 1:A:1388:ASN:ND2 | 2.39 | 0.56 |
| 1:A:78:LEU:HD23 | 1:A:82:TYR:HB3 | 1.88 | 0.56 |
| 1:A:1655:MET:CE | 7:A:2013:LPE:H172 | 2.35 | 0.55 |
| 1:A:30:ARG:NH1 | 1:A:84:ASP:OD1 | 2.39 | 0.55 |
| 1:A:855:LEU:HD13 | 1:A:1451:LEU:HD22 | 1.88 | 0.55 |
| 3:C:72:CYS:SG | 3:C:75:CYS:N | 2.80 | 0.55 |
| 1:A:139:ASN:HD21 | 1:A:220:ARG:HE | 1.55 | 0.55 |
| 1:A:1328:CYS:HB2 | 1:A:1452:PHE:CZ | 2.42 | 0.54 |
| 1:A:850:PRO:HD2 | 6:A:2005:Y01:HAD1 | 1.89 | 0.54 |
| 1:A:1419:VAL:HG12 | 1:A:1420:ASN:H | 1.73 | 0.53 |
| 1:A:960:LEU:HD22 | 9:A:2017:A1E26:C27 | 2.39 | 0.53 |
| 1:A:848:SER:O | 6:A:2005:Y01:CAR | 2.57 | 0.53 |
| 1:A:842:VAL:HG11 | 1:A:1334:ILE:HD11 | 1.92 | 0.52 |
| 1:A:251:LEU:HD11 | 1:A:1633:LEU:HD12 | 1.90 | 0.52 |
| 1:A:1210:ALA:HB3 | 7:A:2014:LPE:H11 | 1.90 | 0.52 |
| 3:C:62:GLN:HG3 | 3:C:132:PRO:HG2 | 1.91 | 0.52 |
| 1:A:1658:TYR:CZ | 7:A:2010:LPE:O31 | 2.63 | 0.51 |
| 1:A:949:MET:CB | 8:A:2012:PCW:H20 | 2.40 | 0.51 |
| 1:A:945:LEU:CD2 | 8:A:2012:PCW:H342 | 2.42 | 0.50 |
| 1:A:14:HIS:CE1 | 1:A:70:MET:HG3 | 2.46 | 0.50 |
| 1:A:120:ILE:O | 1:A:124:VAL:HG22 | 2.12 | 0.50 |
| 1:A:849:TRP:CE3 | 6:A:2005:Y01:CAE | 2.95 | 0.50 |
| 1:A:89:ILE:HG23 | 1:A:98:PHE:O | 2.12 | 0.49 |
| 1:A:849:TRP:CG | 6:A:2005:Y01:CAD | 2.95 | 0.49 |
| 1:A:1502:ASN:O | 1:A:1506:GLY:N | 2.34 | 0.49 |
| 1:A:1658:TYR:HE1 | 7:A:2010:LPE:H1N2 | 1.78 | 0.49 |
| 1:A:1738:PHE:CD1 | 7:A:2008:LPE:H161 | 2.49 | 0.48 |
| 1:A:340:GLY:HA3 | 8:A:2012:PCW:H61 | 1.95 | 0.48 |
| 1:A:949:MET:CB | 8:A:2012:PCW:H232 | 2.41 | 0.48 |
| 1:A:768:MET:HE2 | 1:A:773:LYS:HG2 | 1.94 | 0.48 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 2:B:152:ARG:HH21 | 2:B:157:ILE:HD13 | 1.78 | 0.48 |
| 1:A:1560:GLY:HA2 | 1:A:1563:VAL:HG22 | 1.96 | 0.47 |
| 1:A:1739:TYR:HA | 7:A:2010:LPE:H1N1 | 1.96 | 0.47 |
| 1:A:348:SER:HB3 | 8:A:2012:PCW:H332 | 1.97 | 0.47 |
| 1:A:1191:HIS:CE1 | 1:A:1193:TRP:HD1 | 2.33 | 0.47 |
| 1:A:760:PHE:CZ | 1:A:779:GLY:HA3 | 2.49 | 0.47 |
| 2:B:178:MET:HE1 | 7:B:304:LPE:C11 | 2.40 | 0.47 |
| 1:A:1685:GLY:O | 1:A:1689:ILE:HG12 | 2.15 | 0.46 |
| 1:A:1402:VAL:HA | 1:A:1408:TRP:HB3 | 1.97 | 0.46 |
| 1:A:1658:TYR:CE1 | 7:A:2010:LPE:H1N2 | 2.51 | 0.46 |
| 7:A:2010:LPE:H142 | 7:A:2010:LPE:H112 | 1.38 | 0.46 |
| 2:B:42:SER:O | 2:B:125:ARG:NH2 | 2.47 | 0.46 |
| 1:A:849:TRP:CA | 6:A:2005:Y01:HAD2 | 2.43 | 0.46 |
| 1:A:849:TRP:CD2 | 6:A:2005:Y01:HAE1 | 2.50 | 0.46 |
| 1:A:1443:PHE:CZ | 6:A:2006:Y01:CAB | 2.99 | 0.45 |
| 1:A:296:GLU:HA | 1:A:299:PHE:HB2 | 1.98 | 0.45 |
| 1:A:760:PHE:CZ | 1:A:776:LEU:HA | 2.51 | 0.45 |
| 1:A:351:PHE:CD2 | 8:A:2012:PCW:H412 | 2.52 | 0.45 |
| 6:A:2016:Y01:HAP1 | 6:A:2016:Y01:HAO2 | 1.26 | 0.45 |
| 3:C:30:MET:HB3 | 3:C:136:HIS:HB3 | 1.98 | 0.45 |
| 2:B:43:CYS:SG | 2:B:102:GLN:NE2 | 2.89 | 0.45 |
| 4:D:1:NAG:O3 | 4:D:2:NAG:N2 | 2.50 | 0.45 |
| 2:B:113:TYR:HA | 2:B:146:VAL:HG11 | 1.98 | 0.45 |
| 1:A:1690:CYS:O | 1:A:1694:ILE:HG12 | 2.17 | 0.45 |
| 3:C:92:LEU:O | 3:C:96:GLN:N | 2.50 | 0.45 |
| 1:A:356:ARG:NH2 | 1:A:362:TYR:O | 2.49 | 0.45 |
| 1:A:760:PHE:HA | 1:A:763:MET:HE2 | 1.98 | 0.45 |
| 1:A:1419:VAL:HG23 | 1:A:1425:PRO:HA | 1.98 | 0.44 |
| 8:A:2009:PCW:H412 | 8:A:2009:PCW:H442 | 1.72 | 0.44 |
| 2:B:93:ASN:O | 2:B:105:SER:OG | 2.35 | 0.44 |
| 2:B:113:TYR:O | 2:B:116:SER:OG | 2.27 | 0.44 |
| 1:A:1408:TRP:H | 1:A:1408:TRP:CD1 | 2.35 | 0.44 |
| 1:A:60:PRO:HG2 | 1:A:62:ILE:HG12 | 1.98 | 0.43 |
| 8:A:2009:PCW:H352 | 6:A:2016:Y01:HAK1 | 2.00 | 0.43 |
| 6:A:2016:Y01:HAC2 | 6:A:2016:Y01:HAJ1 | 1.74 | 0.43 |
| 7:A:2014:LPE:H112 | 7:A:2014:LPE:H141 | 1.84 | 0.43 |
| 1:A:266:LEU:O | 1:A:1610:ARG:NH1 | 2.50 | 0.43 |
| 1:A:27:ILE:O | 1:A:31:LYS:HG2 | 2.19 | 0.43 |
| 1:A:1452:PHE:O | 1:A:1455:VAL:HG22 | 2.18 | 0.43 |
| 1:A:55:ALA:HA | 1:A:97:ILE:HG23 | 2.00 | 0.43 |
| 3:C:32:VAL:HG12 | 3:C:34:VAL:HG13 | 2.01 | 0.43 |

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| Atom-1 | Atom-2 | Interatomic distance (Å) | Clash overlap (Å) |
|---|---|---|---|
| 3:C:67:TRP:HB3 | 3:C:80:PHE:CZ | 2.54 | 0.43 |
| 1:A:1581:PHE:HA | 1:A:1584:VAL:HG22 | 2.00 | 0.43 |
| 1:A:1661:PHE:CD2 | 7:A:2010:LPE:H311 | 2.53 | 0.43 |
| 1:A:382:PHE:HA | 1:A:385:VAL:HG12 | 2.01 | 0.43 |
| 6:A:2016:Y01:HAE2 | 6:A:2016:Y01:HBB | 1.92 | 0.42 |
| 1:A:854:MET:O | 1:A:858:ILE:HG12 | 2.19 | 0.42 |
| 1:A:1669:VAL:HG23 | 1:A:1730:CYS:HA | 2.00 | 0.42 |
| 1:A:1348:TYR:CE1 | 1:A:1384:ASN:HB2 | 2.54 | 0.42 |
| 3:C:45:ASP:HB3 | 3:C:113:MET:HE1 | 2.01 | 0.42 |
| 1:A:949:MET:HB2 | 8:A:2012:PCW:H20 | 2.00 | 0.42 |
| 1:A:1406:LYS:HE2 | 1:A:1698:ALA:HA | 2.00 | 0.42 |
| 2:B:148:ASP:OD1 | 2:B:148:ASP:N | 2.50 | 0.42 |
| 4:D:1:NAG:H4 | 4:D:2:NAG:H2 | 1.77 | 0.42 |
| 1:A:813:SER:HA | 1:A:816:VAL:HG12 | 2.02 | 0.42 |
| 8:A:2012:PCW:H322 | 8:A:2012:PCW:H122 | 2.00 | 0.42 |
| 1:A:849:TRP:CG | 6:A:2005:Y01:HAD3 | 2.46 | 0.41 |
| 1:A:908:TRP:NE1 | 1:A:1413:TYR:OH | 2.46 | 0.41 |
| 1:A:1289:LEU:HA | 1:A:1292:LEU:HD13 | 2.02 | 0.41 |
| 8:A:2012:PCW:C43 | 7:A:2015:LPE:H152 | 2.50 | 0.41 |
| 3:C:127:CYS:SG | 3:C:129:ILE:HD11 | 2.61 | 0.41 |
| 1:A:1528:ASN:HD21 | 1:A:1619:ARG:HE | 1.69 | 0.41 |
| 2:B:89:ARG:HH11 | 2:B:110:ASN:HB3 | 1.85 | 0.41 |
| 1:A:22:LEU:HA | 1:A:25:GLN:HG2 | 2.03 | 0.41 |
| 1:A:1365:PRO:HD2 | 1:A:1369:GLU:HG3 | 2.01 | 0.41 |
| 2:B:78:LEU:HD22 | 2:B:92:TRP:HB2 | 2.02 | 0.41 |
| 1:A:276:PHE:CE1 | 1:A:302:TYR:HB3 | 2.56 | 0.40 |
| 1:A:1690:CYS:HB3 | 1:A:1703:LEU:HD21 | 2.03 | 0.40 |
| 3:C:34:VAL:HG12 | 3:C:50:CYS:HA | 2.03 | 0.40 |
| 1:A:231:LEU:HD11 | 1:A:871:LEU:HD23 | 2.02 | 0.40 |
| 1:A:1585:VAL:HG11 | 1:A:1622:ARG:HD3 | 2.03 | 0.40 |
| 1:A:839:LEU:HB3 | 1:A:1334:ILE:HD12 | 2.02 | 0.40 |
| 1:A:1310:VAL:O | 1:A:1314:LEU:HG | 2.22 | 0.40 |
| 1:A:270:ASN:HD22 | 1:A:374:ALA:HB2 | 1.86 | 0.40 |

There are no symmetry-related clashes.

## 5.3 Torsion angles ⓘ

### 5.3.1 Protein backbone ⓘ

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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

| Mol | Chain | Analysed | Favoured | Allowed | Outliers | Percentiles | |
|-----|-------|----------|----------|---------|----------|-----|-----|
| 1 | A | 1166/1988 (59%) | 1148 (98%) | 18 (2%) | 0 | 100 | 100 |
| 2 | B | 171/173 (99%) | 171 (100%) | 0 | 0 | 100 | 100 |
| 3 | C | 117/119 (98%) | 116 (99%) | 1 (1%) | 0 | 100 | 100 |
| All | All | 1454/2280 (64%) | 1435 (99%) | 19 (1%) | 0 | 100 | 100 |

There are no Ramachandran outliers to report.

### 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.

| Mol | Chain | Analysed | Rotameric | Outliers | Percentiles | |
|-----|-------|----------|-----------|----------|-----|-----|
| 1 | A | 1056/1778 (59%) | 1055 (100%) | 1 (0%) | 92 | 98 |
| 2 | B | 157/157 (100%) | 157 (100%) | 0 | 100 | 100 |
| 3 | C | 112/112 (100%) | 112 (100%) | 0 | 100 | 100 |
| All | All | 1325/2047 (65%) | 1324 (100%) | 1 (0%) | 92 | 98 |

All (1) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1 | A | 393 | LEU |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|------|------|
| 1 | A | 14 | HIS |
| 1 | A | 139 | ASN |
| 1 | A | 336 | ASN |
| 1 | A | 757 | ASN |
| 1 | A | 941 | GLN |
| 1 | A | 1180 | ASN |
| 1 | A | 1528 | ASN |
| 1 | A | 1539 | GLN |
| 1 | A | 1541 | GLN |
| 3 | C | 62 | GLN |
| 3 | C | 66 | ASN |
| 3 | C | 70 | GLN |
| 3 | C | 82 | GLN |
| 3 | C | 118 | GLN |
| 3 | C | 143 | HIS |

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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

## 5.5 Carbohydrates ⓘ

4 monosaccharides 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).

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|-----|------|--------|------|---------|--------|------|---------|
| | | | | | Counts | RMSZ | $\#|Z| > 2$ | Counts | RMSZ | $\#|Z| > 2$ |
| 4 | NAG | D | 1 | 4,1 | 14,14,15 | 0.33 | 0 | 17,19,21 | 0.46 | 0 |
| 4 | NAG | D | 2 | 4 | 14,14,15 | 0.50 | 0 | 17,19,21 | 0.54 | 0 |
| 4 | NAG | E | 1 | 2,4 | 14,14,15 | 0.26 | 0 | 17,19,21 | 0.48 | 0 |
| 4 | NAG | E | 2 | 4 | 14,14,15 | 0.23 | 0 | 17,19,21 | 0.41 | 0 |

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|-----|------|---------|----------|-------|
| 4 | NAG | D | 1 | 4,1 | - | 0/6/23/26 | 0/1/1/1 |
| 4 | NAG | D | 2 | 4 | - | <mark>3/6/23/26</mark> | 0/1/1/1 |
| 4 | NAG | E | 1 | 2,4 | - | <mark>2/6/23/26</mark> | 0/1/1/1 |
| 4 | NAG | E | 2 | 4 | - | 1/6/23/26 | 0/1/1/1 |

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (6) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms |
|-----|-------|-----|------|-------|
| 4 | E | 1 | NAG | O5-C5-C6-O6 |
| 4 | D | 2 | NAG | C4-C5-C6-O6 |
| 4 | E | 1 | NAG | C4-C5-C6-O6 |
| 4 | D | 2 | NAG | O5-C5-C6-O6 |
| 4 | E | 2 | NAG | C4-C5-C6-O6 |
| 4 | D | 2 | NAG | C3-C2-N2-C7 |

There are no ring outliers.

2 monomers are involved in 2 short contacts:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 4 | D | 1 | NAG | 2 | 0 |
| 4 | D | 2 | NAG | 2 | 0 |

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

## Oligosaccharide Chain D



Bond lengths



Bond angles



Torsions



Rings

**Oligosaccharide Chain E**

Bond lengths      Bond angles

Torsions      Rings
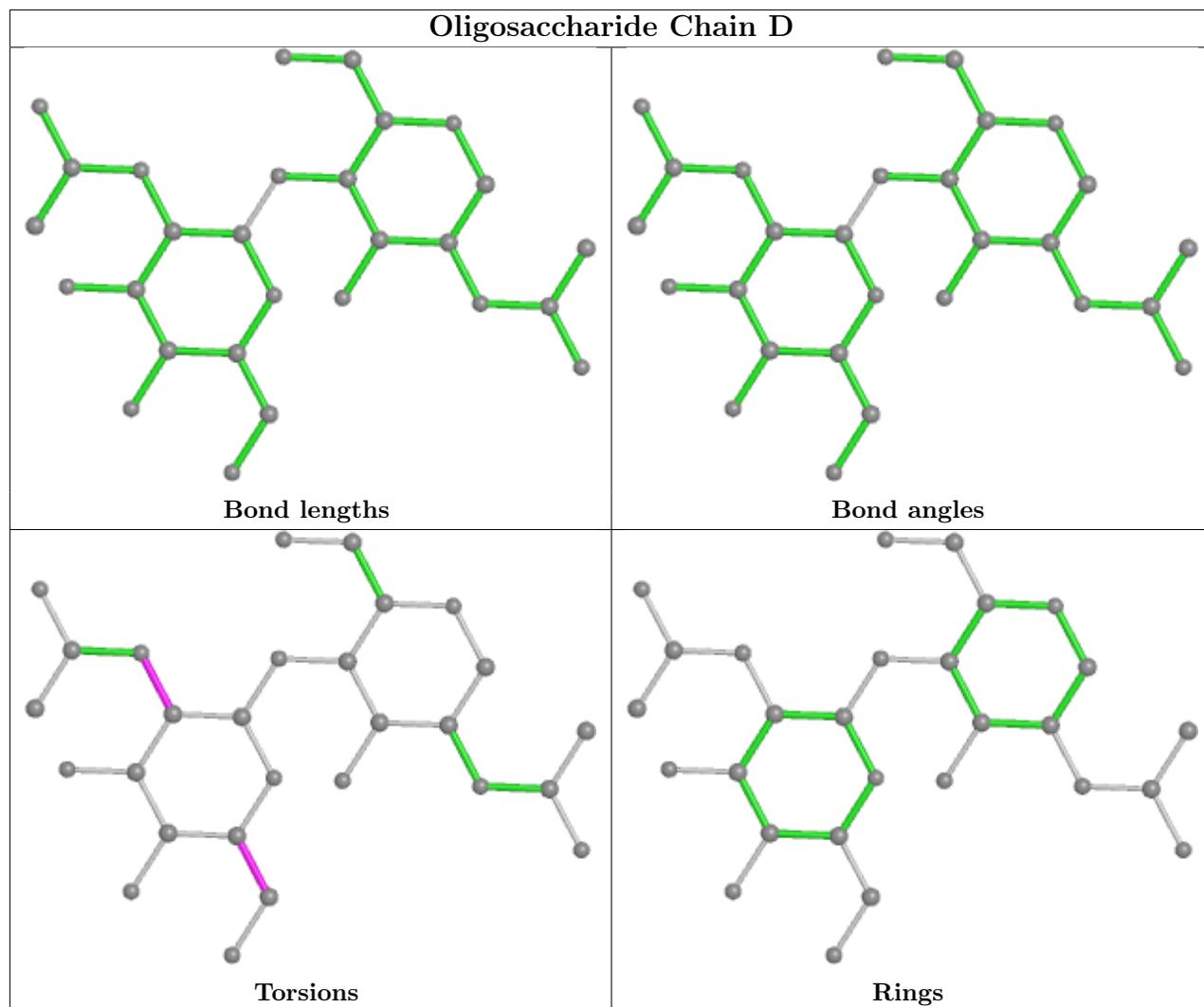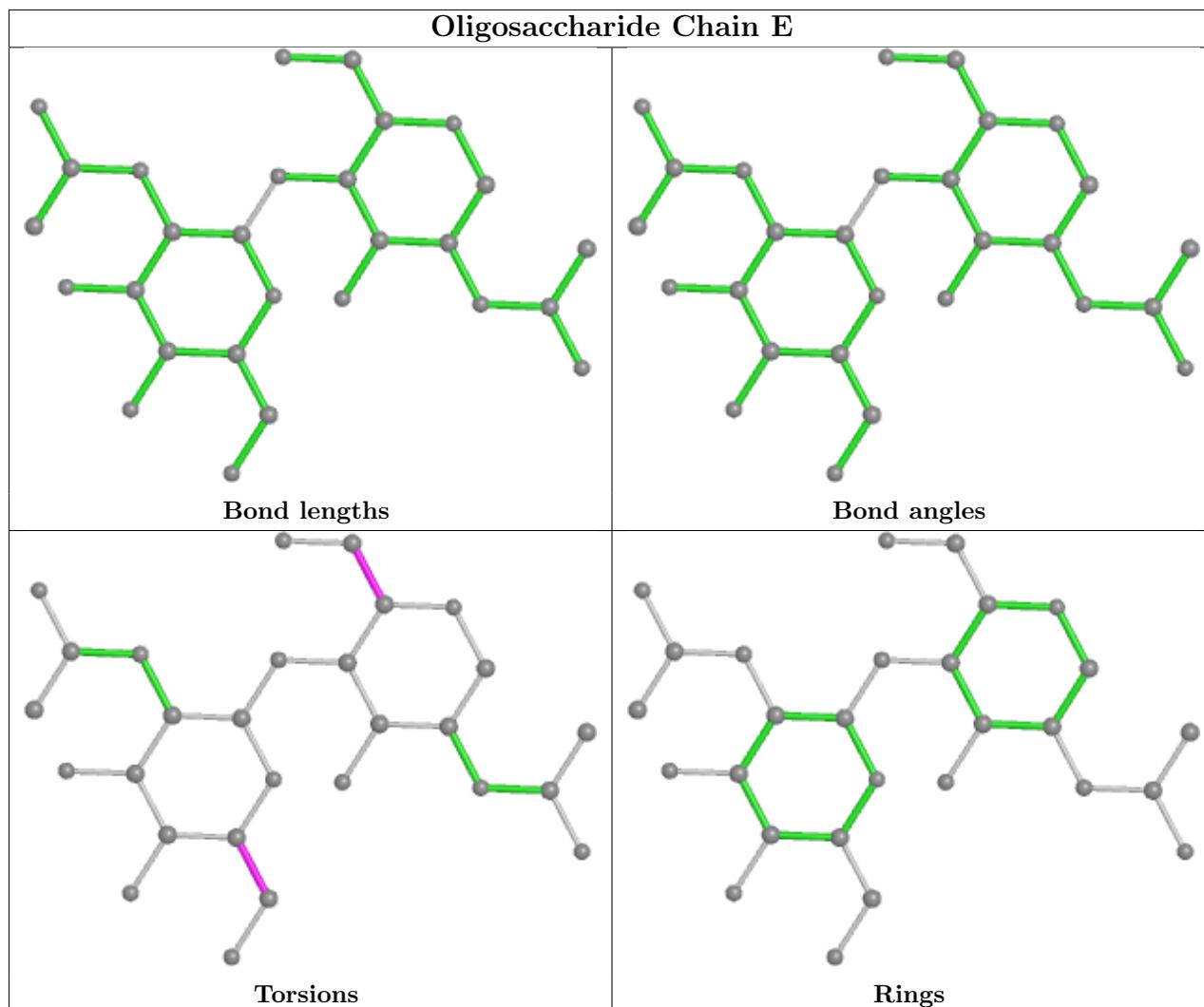
## 5.6 Ligand geometry ⓘ

21 ligands 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).

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Counts | RMSZ | $\#|Z| > 2$ | Counts | RMSZ | $\#|Z| > 2$ |
| 7 | LPE | A | 2013 | - | 24,24,33 | 0.30 | 0 | 28,30,39 | 0.48 | 0 |
| 7 | LPE | A | 2011 | - | 27,27,33 | 0.26 | 0 | 31,33,39 | 0.36 | 0 |
| 6 | Y01 | A | 2006 | - | 38,38,38 | 0.44 | 0 | 57,57,57 | 0.54 | 0 |
| 5 | NAG | A | 2003 | 1 | 14,14,15 | 0.25 | 0 | 17,19,21 | 0.52 | 0 |

| Mol | Type | Chain | Res | Link | Bond lengths | | | Bond angles | | |
|-----|------|-------|-----|------|--------|------|---------|--------|------|---------|
| | | | | | Counts | RMSZ | #\|Z\| > 2 | Counts | RMSZ | #\|Z\| > 2 |
| 7 | LPE | B | 304 | - | 16,16,33 | 0.36 | 0 | 20,22,39 | 0.41 | 0 |
| 6 | Y01 | A | 2005 | - | 38,38,38 | 0.44 | 0 | 57,57,57 | 0.63 | 0 |
| 5 | NAG | A | 2002 | 1 | 14,14,15 | 0.20 | 0 | 17,19,21 | 0.41 | 0 |
| 5 | NAG | B | 301 | 2 | 14,14,15 | 0.18 | 0 | 17,19,21 | 0.43 | 0 |
| 6 | Y01 | A | 2016 | - | 38,38,38 | 0.47 | 0 | 57,57,57 | 0.60 | 0 |
| 8 | PCW | A | 2009 | - | 50,50,53 | 0.35 | 0 | 56,58,61 | 0.30 | 0 |
| 5 | NAG | B | 302 | 2 | 14,14,15 | 0.20 | 0 | 17,19,21 | 0.41 | 0 |
| 6 | Y01 | A | 2004 | - | 38,38,38 | 0.46 | 0 | 57,57,57 | 0.49 | 0 |
| 5 | NAG | A | 2001 | 1 | 14,14,15 | 0.26 | 0 | 17,19,21 | 0.43 | 0 |
| 9 | A1E26 | A | 2017 | - | 52,55,55 | 1.25 | 3 (5%) | 62,95,95 | 0.75 | 2 (3%) |
| 7 | LPE | A | 2007 | - | 24,24,33 | 0.28 | 0 | 28,30,39 | 0.37 | 0 |
| 7 | LPE | A | 2008 | - | 24,24,33 | 0.31 | 0 | 25,27,39 | 0.41 | 0 |
| 7 | LPE | A | 2010 | - | 21,21,33 | 0.37 | 0 | 25,27,39 | 0.54 | 0 |
| 8 | PCW | A | 2012 | - | 46,46,53 | 0.35 | 0 | 52,54,61 | 0.35 | 0 |
| 7 | LPE | A | 2015 | - | 24,24,33 | 0.29 | 0 | 28,30,39 | 0.39 | 0 |
| 5 | NAG | B | 303 | 2 | 14,14,15 | 0.25 | 0 | 17,19,21 | 0.41 | 0 |
| 7 | LPE | A | 2014 | - | 24,24,33 | 0.28 | 0 | 28,30,39 | 0.36 | 0 |

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|-----|------|---------|----------|-------|
| 7 | LPE | A | 2013 | - | - | 16/25/25/34 | - |
| 7 | LPE | A | 2011 | - | - | 6/28/28/34 | - |
| 6 | Y01 | A | 2006 | - | - | 9/19/77/77 | 0/4/4/4 |
| 5 | NAG | A | 2003 | 1 | - | 1/6/23/26 | 0/1/1/1 |
| 7 | LPE | B | 304 | - | - | 13/17/17/34 | - |
| 6 | Y01 | A | 2005 | - | - | 10/19/77/77 | 0/4/4/4 |
| 5 | NAG | A | 2002 | 1 | - | 2/6/23/26 | 0/1/1/1 |
| 5 | NAG | B | 301 | 2 | - | 2/6/23/26 | 0/1/1/1 |
| 6 | Y01 | A | 2016 | - | - | 12/19/77/77 | 0/4/4/4 |
| 8 | PCW | A | 2009 | - | - | 34/54/54/57 | - |
| 5 | NAG | B | 302 | 2 | - | 2/6/23/26 | 0/1/1/1 |
| 6 | Y01 | A | 2004 | - | - | 2/19/77/77 | 0/4/4/4 |
| 5 | NAG | A | 2001 | 1 | - | 2/6/23/26 | 0/1/1/1 |
| 9 | A1E26 | A | 2017 | - | - | 2/12/138/138 | 0/1/8/8 |
| 7 | LPE | A | 2007 | - | - | 5/25/25/34 | - |

*Continued on next page...*

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| Mol | Type | Chain | Res | Link | Chirals | Torsions | Rings |
|-----|------|-------|-----|------|---------|----------|-------|
| 7 | LPE | A | 2008 | - | - | 5/25/25/34 | - |
| 7 | LPE | A | 2010 | - | - | 15/22/22/34 | - |
| 8 | PCW | A | 2012 | - | - | 36/50/50/57 | - |
| 7 | LPE | A | 2015 | - | - | 15/25/25/34 | - |
| 5 | NAG | B | 303 | 2 | - | 0/6/23/26 | 0/1/1/1 |
| 7 | LPE | A | 2014 | - | - | 21/25/25/34 | - |

All (3) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|---|-------------|----------|
| 9 | A | 2017 | A1E26 | C17-C20 | -6.21 | 1.49 | 1.57 |
| 9 | A | 2017 | A1E26 | C22-N1 | 3.82 | 1.52 | 1.48 |
| 9 | A | 2017 | A1E26 | C14-C8 | -3.51 | 1.49 | 1.55 |

All (2) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z | Observed($^o$) | Ideal($^o$) |
|-----|-------|-----|------|-------|---|----------------|-------------|
| 9 | A | 2017 | A1E26 | C26-N1-C22 | -2.11 | 107.19 | 111.35 |
| 9 | A | 2017 | A1E26 | C20-C17-C13 | 2.10 | 114.52 | 111.20 |

There are no chirality outliers.

All (210) torsion outliers are listed below:

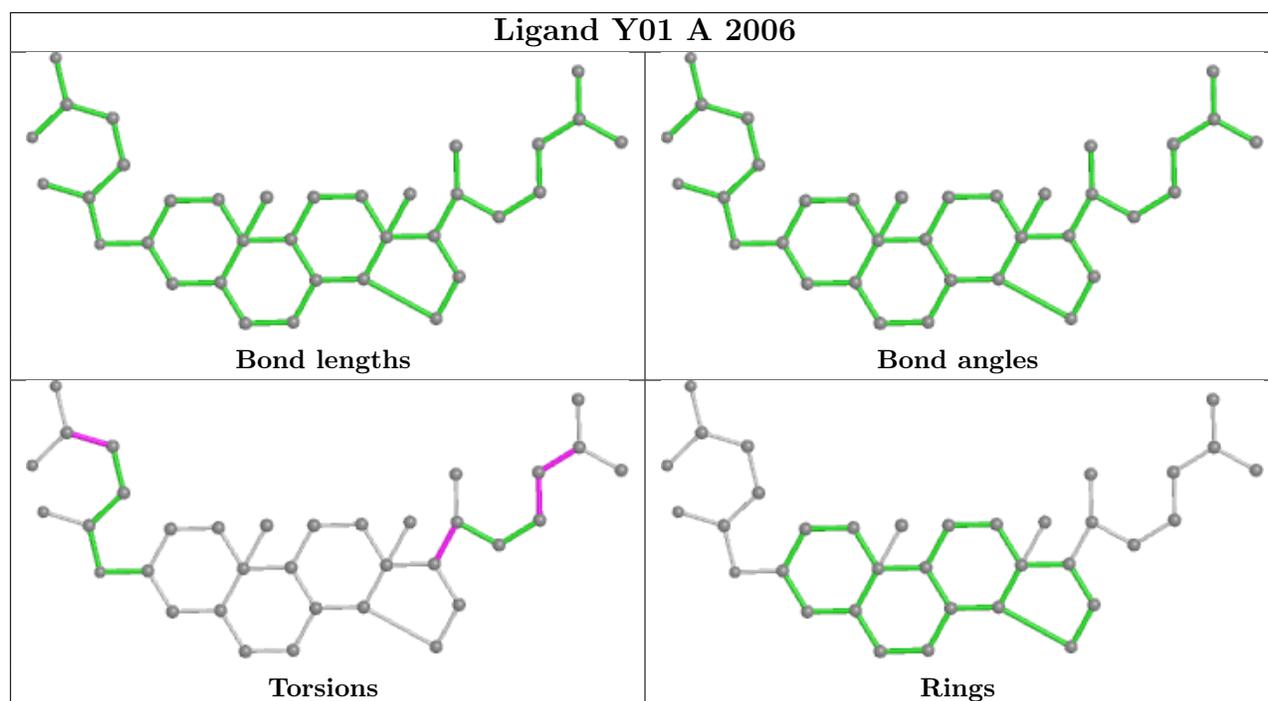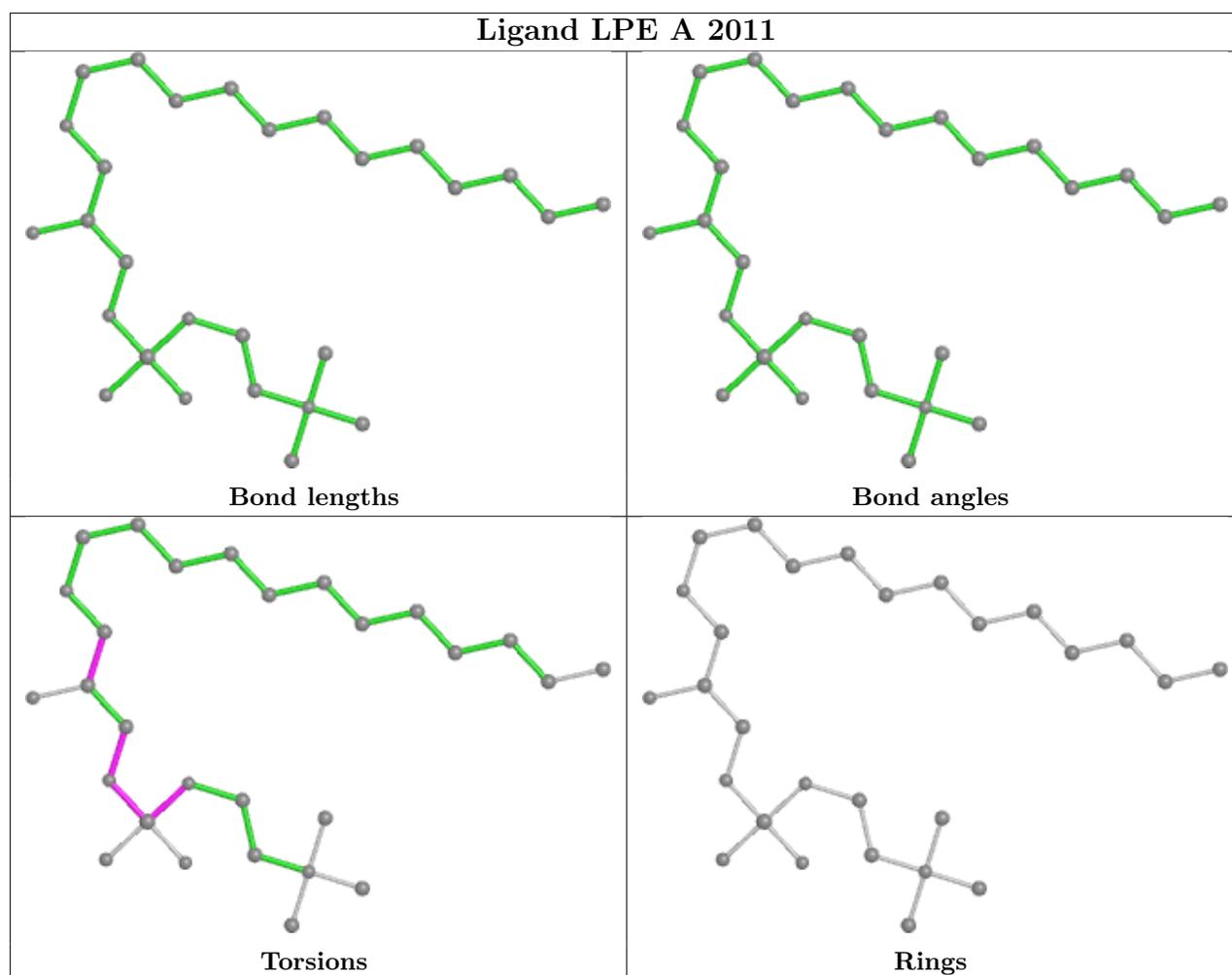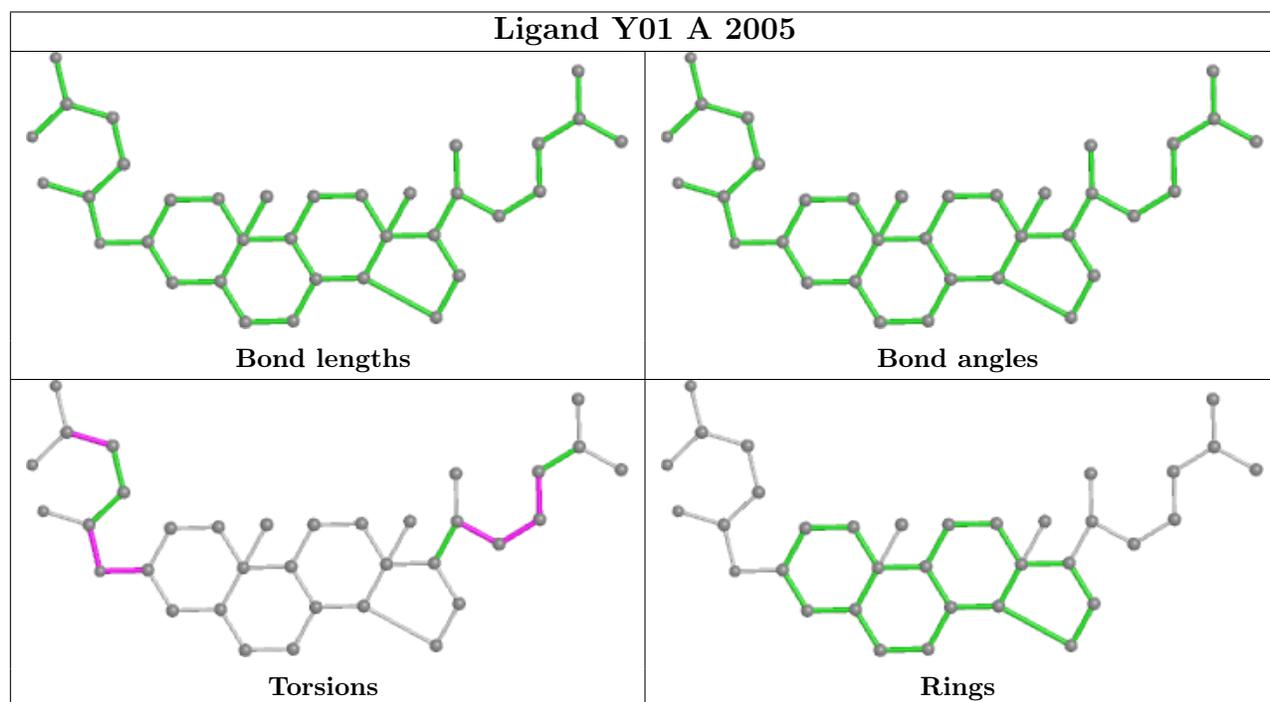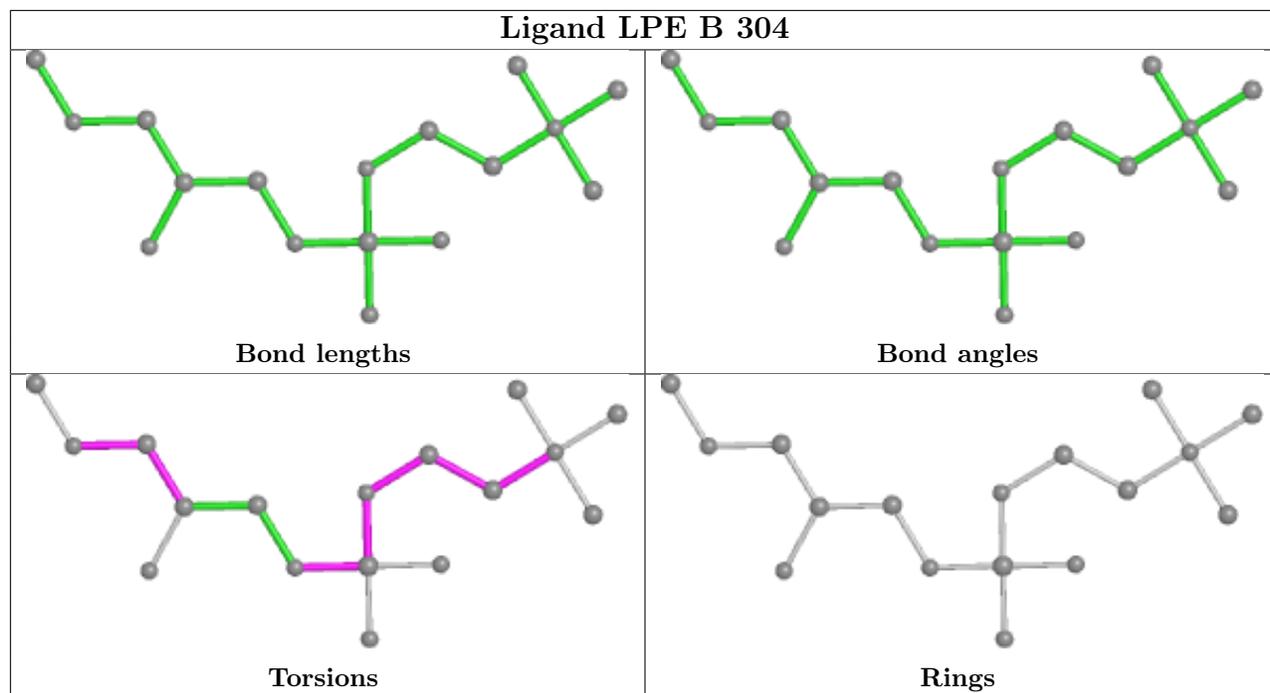| Mol | Chain | Res | Type | Atoms |
|-----|-------|-----|------|-------|
| 6 | A | 2005 | Y01 | CAR-CBC-OAW-CAY |
| 6 | A | 2016 | Y01 | CAO-CBB-CBE-CAP |
| 6 | A | 2016 | Y01 | CAC-CBB-CBE-CBI |
| 7 | A | 2008 | LPE | C31-O33-P-O31 |
| 7 | A | 2008 | LPE | C32-C31-O33-P |
| 7 | A | 2010 | LPE | O1-C1-C2-O2H |
| 7 | A | 2010 | LPE | O1-C1-C2-C3 |
| 7 | A | 2010 | LPE | C1-C2-C3-O3 |
| 7 | A | 2010 | LPE | C3-O3-P-O31 |
| 7 | A | 2010 | LPE | C3-O3-P-O32 |
| 7 | A | 2010 | LPE | C31-O33-P-O3 |
| 7 | A | 2013 | LPE | O1-C1-C2-O2H |
| 7 | A | 2013 | LPE | O1-C1-C2-C3 |
| 7 | A | 2013 | LPE | O2H-C2-C3-O3 |
| 7 | A | 2013 | LPE | C3-O3-P-O32 |
| 7 | A | 2013 | LPE | C31-O33-P-O3 |

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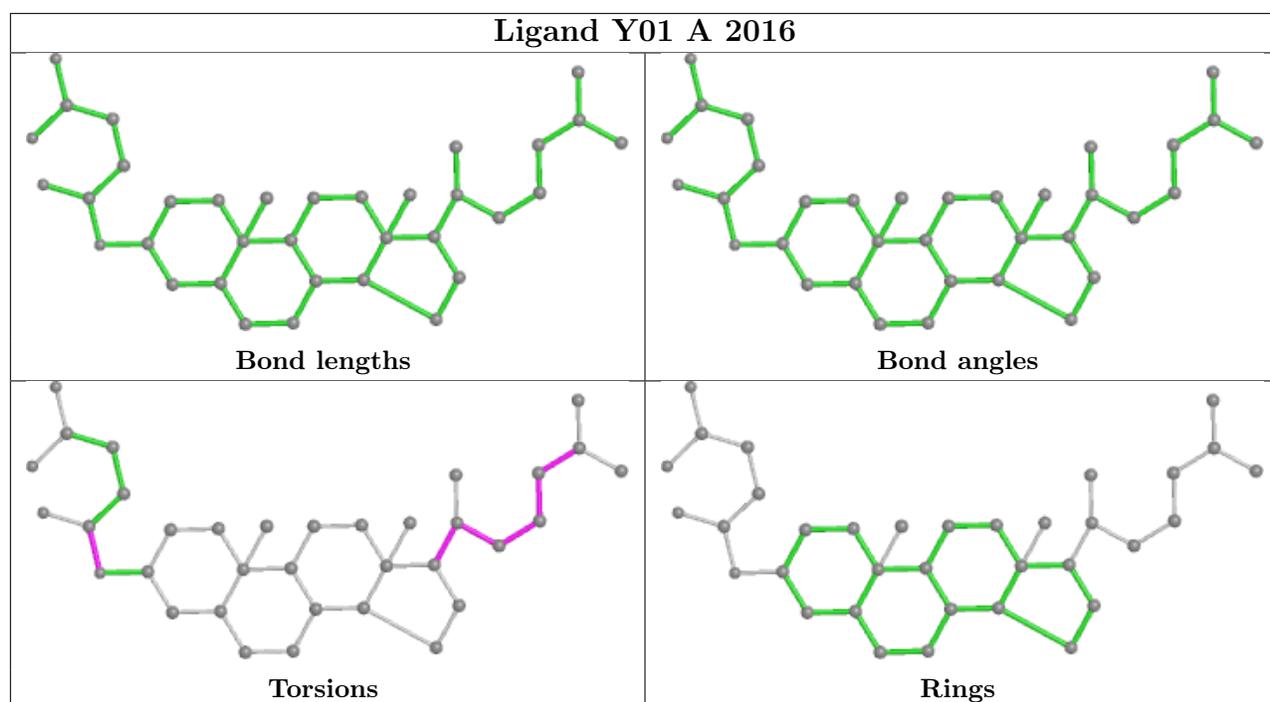| Mol | Chain | Res | Type | Atoms |
|-----|-------|-----|------|-------|
| 7 | A | 2013 | LPE | C31-O33-P-O31 |
| 7 | A | 2013 | LPE | C31-O33-P-O32 |
| 7 | A | 2013 | LPE | O33-C31-C32-N |
| 7 | A | 2014 | LPE | O1-C1-C2-O2H |
| 7 | A | 2014 | LPE | C3-O3-P-O32 |
| 7 | A | 2015 | LPE | O2H-C2-C3-O3 |
| 7 | A | 2015 | LPE | C3-O3-P-O31 |
| 7 | A | 2015 | LPE | C3-O3-P-O32 |
| 7 | A | 2015 | LPE | O33-C31-C32-N |
| 7 | B | 304 | LPE | O1-C1-C2-O2H |
| 7 | B | 304 | LPE | O1-C1-C2-C3 |
| 7 | B | 304 | LPE | C3-O3-P-O31 |
| 7 | B | 304 | LPE | O33-C31-C32-N |
| 8 | A | 2009 | PCW | O4P-C4-C5-N |
| 8 | A | 2009 | PCW | C1-O3P-P-O1P |
| 8 | A | 2009 | PCW | C1-O3P-P-O2P |
| 8 | A | 2009 | PCW | C1-O3P-P-O4P |
| 8 | A | 2009 | PCW | C4-O4P-P-O1P |
| 8 | A | 2009 | PCW | C4-O4P-P-O2P |
| 8 | A | 2009 | PCW | C4-O4P-P-O3P |
| 8 | A | 2012 | PCW | C40-C41-C42-C43 |
| 8 | A | 2012 | PCW | C1-O3P-P-O2P |
| 8 | A | 2012 | PCW | C4-O4P-P-O1P |
| 8 | A | 2012 | PCW | C4-O4P-P-O2P |
| 8 | A | 2012 | PCW | C4-O4P-P-O3P |
| 6 | A | 2016 | Y01 | CAC-CBB-CBE-CAP |
| 6 | A | 2016 | Y01 | CAO-CBB-CBE-CBI |
| 7 | A | 2010 | LPE | C11-C12-C13-C14 |
| 6 | A | 2016 | Y01 | CAJ-CAO-CBB-CAC |
| 8 | A | 2009 | PCW | C18-C19-C20-C21 |
| 8 | A | 2009 | PCW | C4-C5-N-C6 |
| 5 | A | 2001 | NAG | O5-C5-C6-O6 |
| 7 | A | 2010 | LPE | O2H-C2-C3-O3 |
| 8 | A | 2012 | PCW | C12-C11-O3-C3 |
| 8 | A | 2009 | PCW | C41-C42-C43-C44 |
| 8 | A | 2012 | PCW | O11-C11-O3-C3 |
| 5 | A | 2001 | NAG | C4-C5-C6-O6 |
| 7 | A | 2013 | LPE | C1-C2-C3-O3 |
| 5 | B | 301 | NAG | O5-C5-C6-O6 |
| 7 | A | 2013 | LPE | O1-C11-C12-C13 |
| 5 | B | 302 | NAG | C4-C5-C6-O6 |
| 6 | A | 2016 | Y01 | CAJ-CAO-CBB-CBE |

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| Mol | Chain | Res | Type | Atoms |
|:---:|:---:|:---:|:---:|:---:|
| 7 | A | 2015 | LPE | C11-C12-C13-C14 |
| 5 | B | 301 | NAG | C4-C5-C6-O6 |
| 6 | A | 2005 | Y01 | CAJ-CAO-CBB-CBE |
| 8 | A | 2009 | PCW | C4-C5-N-C7 |
| 6 | A | 2005 | Y01 | CAJ-CAO-CBB-CAC |
| 7 | A | 2010 | LPE | C3-O3-P-O33 |
| 7 | A | 2013 | LPE | C3-O3-P-O33 |
| 7 | A | 2014 | LPE | C3-O3-P-O33 |
| 7 | A | 2014 | LPE | C31-O33-P-O3 |
| 7 | A | 2015 | LPE | C3-O3-P-O33 |
| 7 | B | 304 | LPE | C3-O3-P-O33 |
| 7 | B | 304 | LPE | C31-O33-P-O3 |
| 7 | A | 2015 | LPE | C1-C2-C3-O3 |
| 7 | A | 2015 | LPE | C31-C32-N-C1N |
| 6 | A | 2005 | Y01 | CAO-CAJ-CAN-CBA |
| 7 | A | 2010 | LPE | O1-C11-C12-C13 |
| 7 | A | 2013 | LPE | C12-C13-C14-C15 |
| 8 | A | 2009 | PCW | C15-C16-C17-C18 |
| 8 | A | 2012 | PCW | C38-C39-C40-C41 |
| 8 | A | 2012 | PCW | O31-C31-O2-C2 |
| 6 | A | 2016 | Y01 | CAM-CAY-OAW-CBC |
| 8 | A | 2012 | PCW | C32-C31-O2-C2 |
| 7 | A | 2015 | LPE | C31-C32-N-C2N |
| 7 | A | 2015 | LPE | C31-C32-N-C3N |
| 7 | A | 2014 | LPE | C14-C15-C16-C17 |
| 8 | A | 2012 | PCW | C35-C36-C37-C38 |
| 8 | A | 2012 | PCW | C34-C35-C36-C37 |
| 7 | A | 2014 | LPE | C12-C13-C14-C15 |
| 8 | A | 2009 | PCW | C43-C44-C45-C46 |
| 7 | A | 2013 | LPE | C14-C15-C16-C17 |
| 6 | A | 2016 | Y01 | OAG-CAY-OAW-CBC |
| 6 | A | 2005 | Y01 | CAM-CAY-OAW-CBC |
| 7 | A | 2010 | LPE | C12-C13-C14-C15 |
| 7 | A | 2015 | LPE | C13-C14-C15-C16 |
| 5 | B | 302 | NAG | O5-C5-C6-O6 |
| 7 | A | 2014 | LPE | C13-C14-C15-C16 |
| 8 | A | 2009 | PCW | C4-C5-N-C8 |
| 8 | A | 2012 | PCW | C4-C5-N-C7 |
| 8 | A | 2009 | PCW | C34-C35-C36-C37 |
| 6 | A | 2005 | Y01 | OAG-CAY-OAW-CBC |
| 8 | A | 2009 | PCW | O31-C31-O2-C2 |
| 7 | A | 2014 | LPE | O1-C1-C2-C3 |

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| Mol | Chain | Res | Type | Atoms |
|-----|-------|------|-------|---------------------|
| 8 | A | 2009 | PCW | C35-C36-C37-C38 |
| 8 | A | 2012 | PCW | C12-C13-C14-C15 |
| 8 | A | 2009 | PCW | C32-C31-O2-C2 |
| 8 | A | 2012 | PCW | C36-C37-C38-C39 |
| 9 | A | 2017 | A1E26 | O12-C28-C29-C34 |
| 6 | A | 2004 | Y01 | CAR-CBC-OAW-CAY |
| 8 | A | 2009 | PCW | C33-C34-C35-C36 |
| 7 | A | 2014 | LPE | C2-C1-O1-C11 |
| 8 | A | 2012 | PCW | C39-C40-C41-C42 |
| 5 | A | 2002 | NAG | C4-C5-C6-O6 |
| 7 | A | 2015 | LPE | C12-C13-C14-C15 |
| 8 | A | 2009 | PCW | C16-C17-C18-C19 |
| 7 | A | 2014 | LPE | O2H-C2-C3-O3 |
| 8 | A | 2012 | PCW | C1-C2-C3-O3 |
| 8 | A | 2012 | PCW | C22-C23-C24-C25 |
| 8 | A | 2009 | PCW | C23-C24-C25-C26 |
| 8 | A | 2009 | PCW | C36-C37-C38-C39 |
| 7 | A | 2010 | LPE | C2-C1-O1-C11 |
| 6 | A | 2016 | Y01 | CAN-CAJ-CAO-CBB |
| 8 | A | 2009 | PCW | C37-C38-C39-C40 |
| 8 | A | 2012 | PCW | C4-C5-N-C6 |
| 8 | A | 2012 | PCW | O2-C2-C3-O3 |
| 8 | A | 2012 | PCW | C18-C19-C20-C21 |
| 6 | A | 2004 | Y01 | CAV-CBC-OAW-CAY |
| 8 | A | 2009 | PCW | C32-C33-C34-C35 |
| 7 | A | 2015 | LPE | C14-C15-C16-C17 |
| 6 | A | 2016 | Y01 | CAJ-CAN-CBA-CAB |
| 7 | A | 2007 | LPE | C3-O3-P-O33 |
| 6 | A | 2005 | Y01 | CAN-CAJ-CAO-CBB |
| 8 | A | 2009 | PCW | O3P-C1-C2-O2 |
| 7 | A | 2013 | LPE | C15-C16-C17-C18 |
| 7 | A | 2007 | LPE | C2-C3-O3-P |
| 7 | A | 2014 | LPE | C2-C3-O3-P |
| 7 | A | 2014 | LPE | C15-C16-C17-C18 |
| 6 | A | 2016 | Y01 | CAJ-CAN-CBA-CAA |
| 8 | A | 2009 | PCW | O3P-C1-C2-C3 |
| 8 | A | 2012 | PCW | C20-C21-C22-C23 |
| 8 | A | 2009 | PCW | C42-C43-C44-C45 |
| 8 | A | 2012 | PCW | C33-C34-C35-C36 |
| 8 | A | 2009 | PCW | C22-C23-C24-C25 |
| 7 | A | 2014 | LPE | C1-C2-C3-O3 |
| 7 | A | 2013 | LPE | C13-C14-C15-C16 |

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| Mol | Chain | Res | Type | Atoms |
|:---:|:---:|:---:|:---:|:---:|
| 6 | A | 2006 | Y01 | CAJ-CAN-CBA-CAB |
| 5 | A | 2002 | NAG | O5-C5-C6-O6 |
| 6 | A | 2006 | Y01 | CAO-CBB-CBE-CBI |
| 7 | A | 2014 | LPE | C31-O33-P-O31 |
| 7 | A | 2014 | LPE | C31-C32-N-C2N |
| 7 | B | 304 | LPE | C3-O3-P-O32 |
| 7 | B | 304 | LPE | C31-O33-P-O31 |
| 7 | B | 304 | LPE | C31-C32-N-C1N |
| 8 | A | 2009 | PCW | C11-C12-C13-C14 |
| 7 | A | 2007 | LPE | C32-C31-O33-P |
| 7 | A | 2014 | LPE | C32-C31-O33-P |
| 7 | B | 304 | LPE | C32-C31-O33-P |
| 8 | A | 2012 | PCW | O3P-C1-C2-O2 |
| 9 | A | 2017 | A1E26 | O13-C28-C29-C34 |
| 8 | A | 2012 | PCW | C4-C5-N-C8 |
| 7 | A | 2007 | LPE | O33-C31-C32-N |
| 7 | A | 2010 | LPE | O33-C31-C32-N |
| 7 | A | 2014 | LPE | O33-C31-C32-N |
| 8 | A | 2009 | PCW | C38-C39-C40-C41 |
| 6 | A | 2006 | Y01 | CAC-CBB-CBE-CBI |
| 6 | A | 2006 | Y01 | CAO-CBB-CBE-CAP |
| 7 | A | 2014 | LPE | C31-C32-N-C1N |
| 7 | B | 304 | LPE | C31-C32-N-C2N |
| 8 | A | 2012 | PCW | C23-C24-C25-C26 |
| 7 | A | 2010 | LPE | C13-C14-C15-C16 |
| 8 | A | 2009 | PCW | O3-C11-C12-C13 |
| 7 | A | 2014 | LPE | C16-C17-C18-C19 |
| 6 | A | 2016 | Y01 | CAO-CAJ-CAN-CBA |
| 6 | A | 2006 | Y01 | CAJ-CAN-CBA-CAA |
| 7 | A | 2015 | LPE | C2-C1-O1-C11 |
| 7 | A | 2008 | LPE | C31-O33-P-O3 |
| 7 | A | 2011 | LPE | C3-O3-P-O33 |
| 7 | A | 2011 | LPE | C31-O33-P-O3 |
| 8 | A | 2012 | PCW | C1-O3P-P-O4P |
| 5 | A | 2003 | NAG | C3-C2-N2-C7 |
| 7 | A | 2015 | LPE | C2-C3-O3-P |
| 8 | A | 2012 | PCW | C37-C38-C39-C40 |
| 7 | A | 2011 | LPE | C2-C3-O3-P |
| 7 | A | 2011 | LPE | O1-C1-C2-C3 |
| 7 | A | 2014 | LPE | C31-C32-N-C3N |
| 7 | B | 304 | LPE | C31-C32-N-C3N |
| 6 | A | 2006 | Y01 | CAM-CAL-CAX-OAF |

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| Mol | Chain | Res | Type | Atoms |
|-----|-------|-----|------|-------|
| 8 | A | 2012 | PCW | C32-C33-C34-C35 |
| 7 | A | 2008 | LPE | C14-C15-C16-C17 |
| 6 | A | 2006 | Y01 | CAM-CAL-CAX-OAH |
| 7 | A | 2013 | LPE | C11-C12-C13-C14 |
| 7 | A | 2014 | LPE | C11-C12-C13-C14 |
| 6 | A | 2005 | Y01 | CAM-CAL-CAX-OAH |
| 8 | A | 2012 | PCW | C17-C18-C19-C20 |
| 7 | A | 2008 | LPE | C13-C14-C15-C16 |
| 7 | B | 304 | LPE | C2-C1-O1-C11 |
| 6 | A | 2006 | Y01 | CAO-CAJ-CAN-CBA |
| 6 | A | 2005 | Y01 | CAM-CAL-CAX-OAF |
| 8 | A | 2012 | PCW | O3P-C1-C2-C3 |
| 8 | A | 2012 | PCW | O3-C11-C12-C13 |
| 7 | A | 2007 | LPE | C12-C11-O1-C1 |
| 6 | A | 2006 | Y01 | CAC-CBB-CBE-CAP |
| 8 | A | 2012 | PCW | C19-C20-C21-C22 |
| 8 | A | 2009 | PCW | C39-C40-C41-C42 |
| 6 | A | 2005 | Y01 | CAV-CBC-OAW-CAY |
| 7 | A | 2011 | LPE | C3-O3-P-O31 |
| 7 | A | 2011 | LPE | C31-O33-P-O31 |
| 8 | A | 2012 | PCW | O11-C11-C12-C13 |
| 8 | A | 2009 | PCW | O2-C31-C32-C33 |
| 7 | A | 2010 | LPE | C32-C31-O33-P |
| 8 | A | 2009 | PCW | C5-C4-O4P-P |
| 8 | A | 2012 | PCW | C11-C12-C13-C14 |
| 8 | A | 2012 | PCW | C14-C15-C16-C17 |

There are no ring outliers.

13 monomers are involved in 59 short contacts:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 7 | A | 2013 | LPE | 1 | 0 |
| 7 | A | 2011 | LPE | 2 | 0 |
| 6 | A | 2006 | Y01 | 1 | 0 |
| 7 | B | 304 | LPE | 3 | 0 |
| 6 | A | 2005 | Y01 | 16 | 0 |
| 6 | A | 2016 | Y01 | 9 | 0 |
| 8 | A | 2009 | PCW | 2 | 0 |
| 9 | A | 2017 | A1E26 | 2 | 0 |
| 7 | A | 2008 | LPE | 1 | 0 |
| 7 | A | 2010 | LPE | 6 | 0 |
| 8 | A | 2012 | PCW | 12 | 0 |

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| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 7 | A | 2015 | LPE | 1 | 0 |
| 7 | A | 2014 | LPE | 5 | 0 |

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.

## Ligand LPE A 2013



**Bond lengths**



**Bond angles**



**Torsions**



**Rings**

**Ligand LPE A 2011**



Bond lengths



Bond angles



Torsions



Rings

**Ligand Y01 A 2006**



Bond lengths



Bond angles



Torsions



Rings

**Ligand LPE B 304**



Bond lengths



Bond angles



Torsions



Rings

**Ligand Y01 A 2005**



Bond lengths



Bond angles



Torsions



Rings

## Ligand Y01 A 2016



Bond lengths



Bond angles



Torsions



Rings

## Ligand PCW A 2009



Bond lengths



Bond angles



Torsions



Rings

## Ligand Y01 A 2004


Bond lengths


Bond angles


Torsions


Rings

## Ligand A1E26 A 2017


Bond lengths


Bond angles


Torsions


Rings

## Ligand LPE A 2007



**Bond lengths**

**Bond angles**

**Torsions**

**Rings**

## Ligand LPE A 2008



Bond lengths

Bond angles

Torsions

Rings

## Ligand LPE A 2010



Bond lengths



Bond angles



Torsions



Rings

## Ligand PCW A 2012



Bond lengths



Bond angles



Torsions



Rings

## Ligand LPE A 2015



Bond lengths



Bond angles



Torsions



Rings

Ligand LPE A 2014

Bond lengths

Bond angles

Torsions

Rings

## 5.7 Other polymers ⓘ

There are no such residues in this entry.

## 5.8 Polymer linkage issues ⓘ

There are no chain breaks in this entry.

# 6 Map visualisation ⓘ

This section contains visualisations of the EMDB entry EMD-67990. These allow visual inspection of the internal detail of the map and identification of artifacts.

Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

## 6.1 Orthogonal projections ⓘ

### 6.1.1 Primary map



X           Y           Z

### 6.1.2 Raw map



X           Y           Z
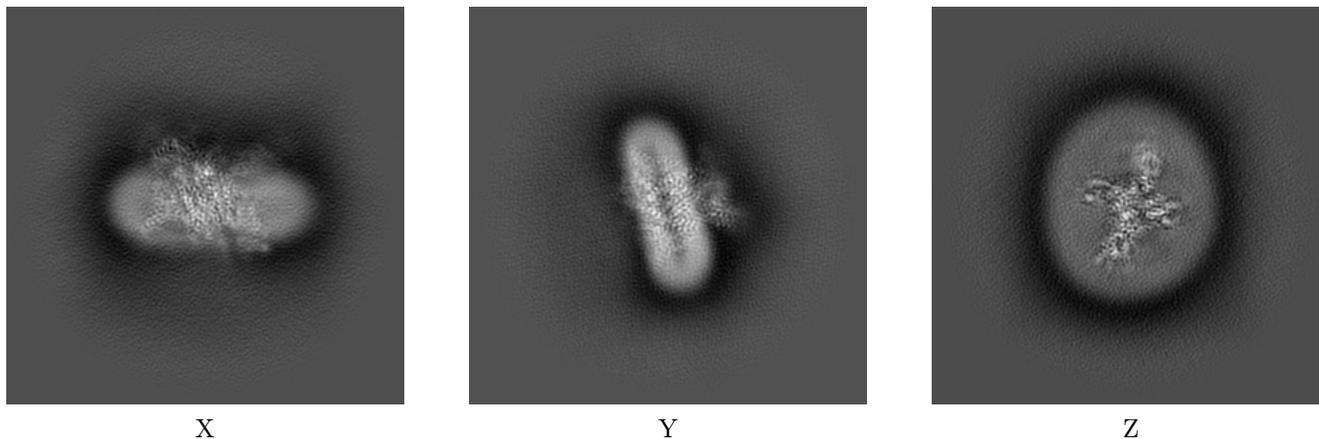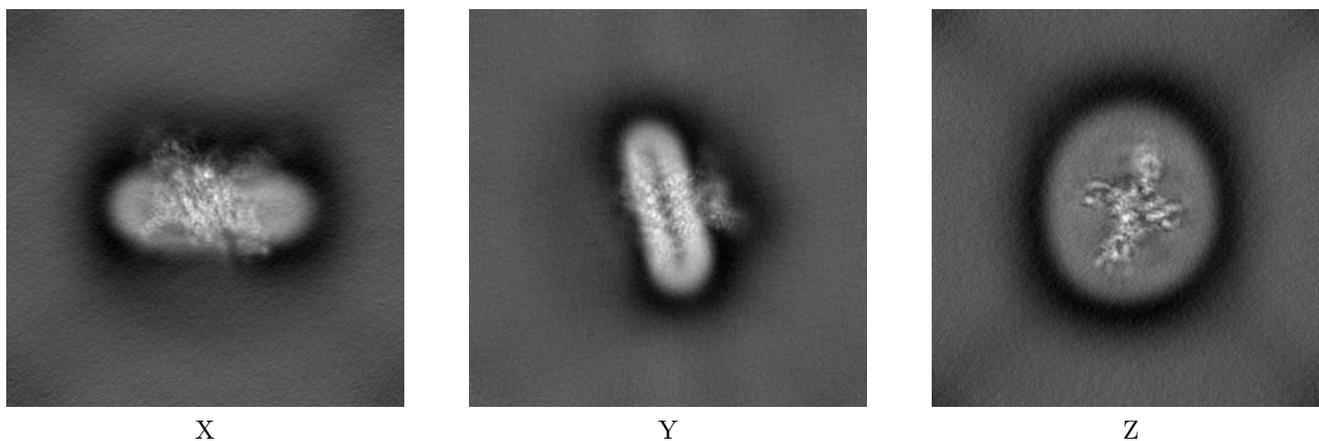
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices ⓘ
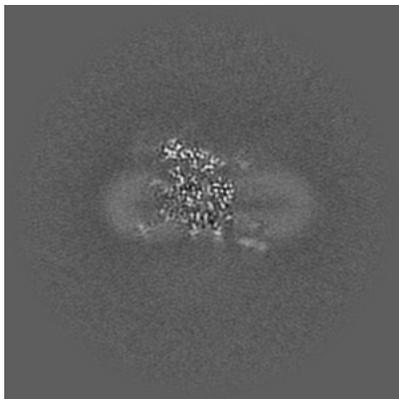
### 6.2.1 Primary map
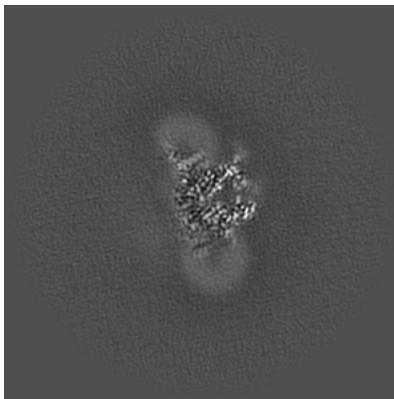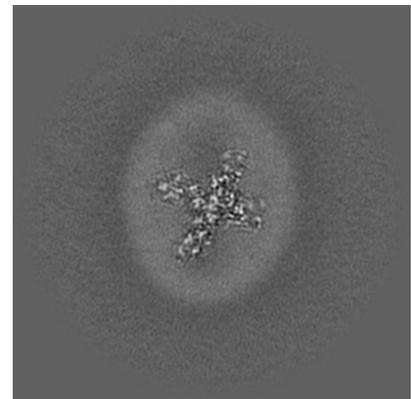


| X Index: 160 | Y Index: 160 | Z Index: 160 |

### 6.2.2 Raw map
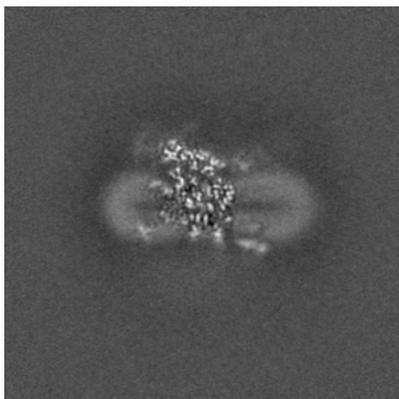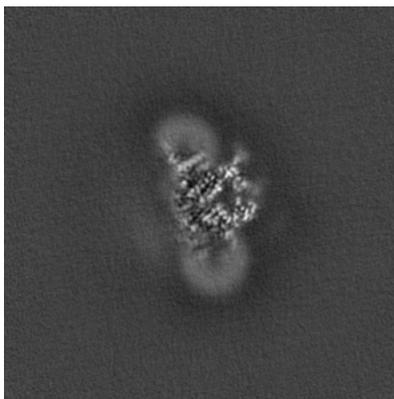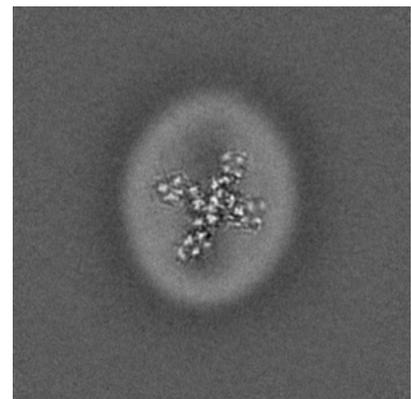


| X Index: 160 | Y Index: 160 | Z Index: 160 |

The images above show central slices of the map in three orthogonal directions.

## 6.3　Largest variance slices ⓘ

### 6.3.1　Primary map
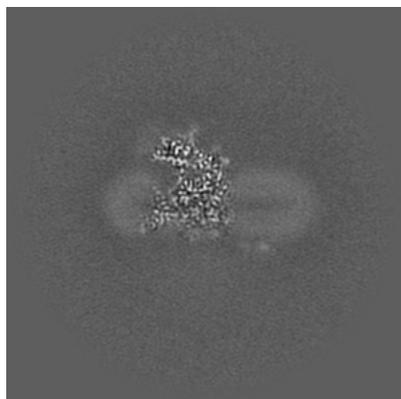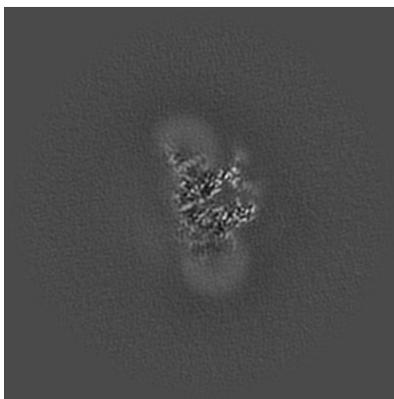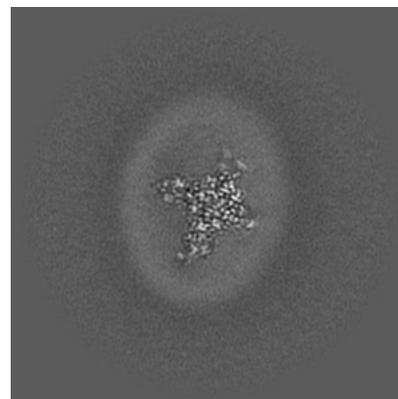


| X Index: 153 | Y Index: 161 | Z Index: 166 |

### 6.3.2　Raw map
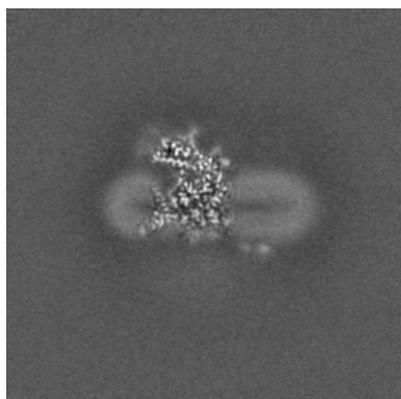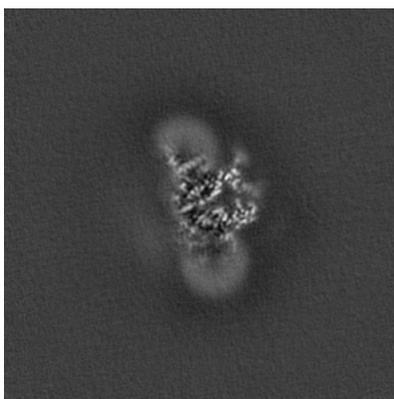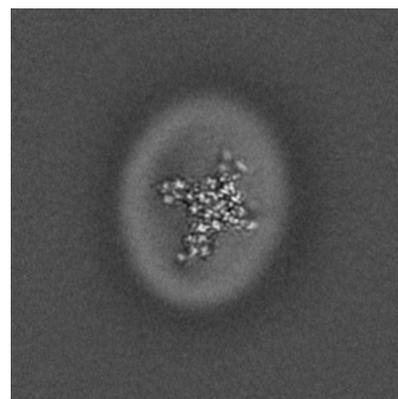


| X Index: 153 | Y Index: 161 | Z Index: 166 |

The images above show the largest variance slices of the map in three orthogonal directions.

## 6.4　Orthogonal standard-deviation projections (False-color) ⓘ

### 6.4.1　Primary map
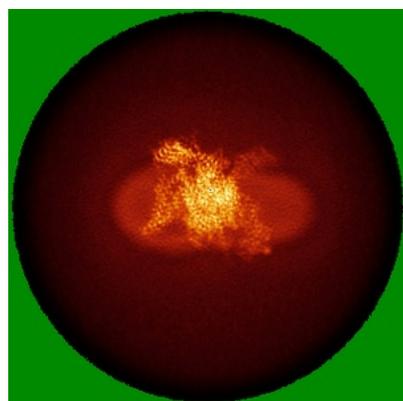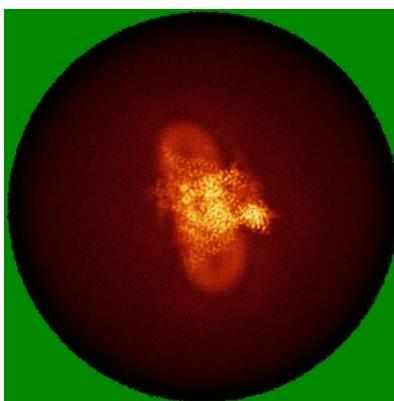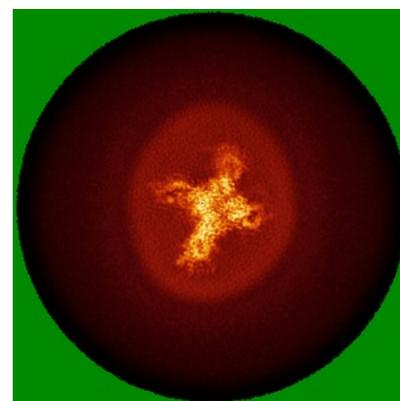


X　　　　　　　　Y　　　　　　　　Z

### 6.4.2　Raw map



X　　　　　　　　Y　　　　　　　　Z
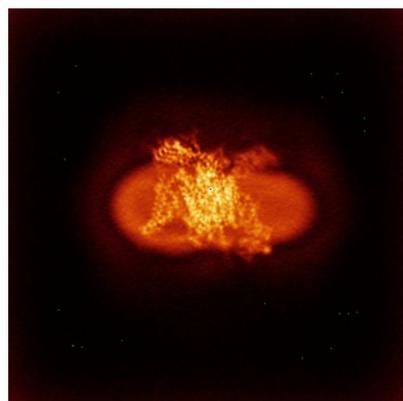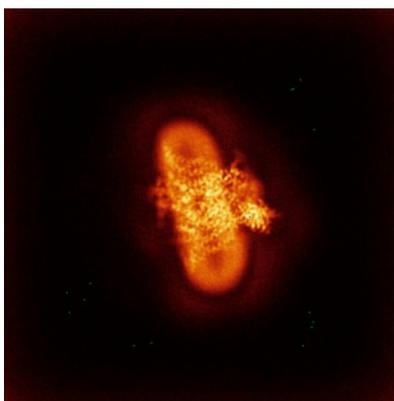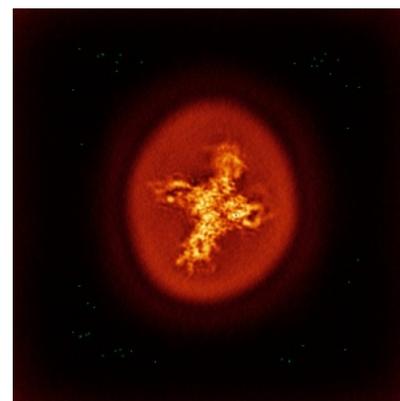
The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

## 6.5 Orthogonal surface views (i)

### 6.5.1 Primary map



| X | Y | Z |

The images above show the 3D surface view of the map at the recommended contour level 0.65. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



| X | Y | Z |

These images show the 3D surface of the raw map. The raw map's contour level was selected so that its surface encloses the same volume as the primary map does at its recommended contour level.

## 6.6 Mask visualisation (i)

This section was not generated. No masks/segmentation were deposited.

# 7 Map analysis ⓘ

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

## 7.1 Map-value distribution ⓘ
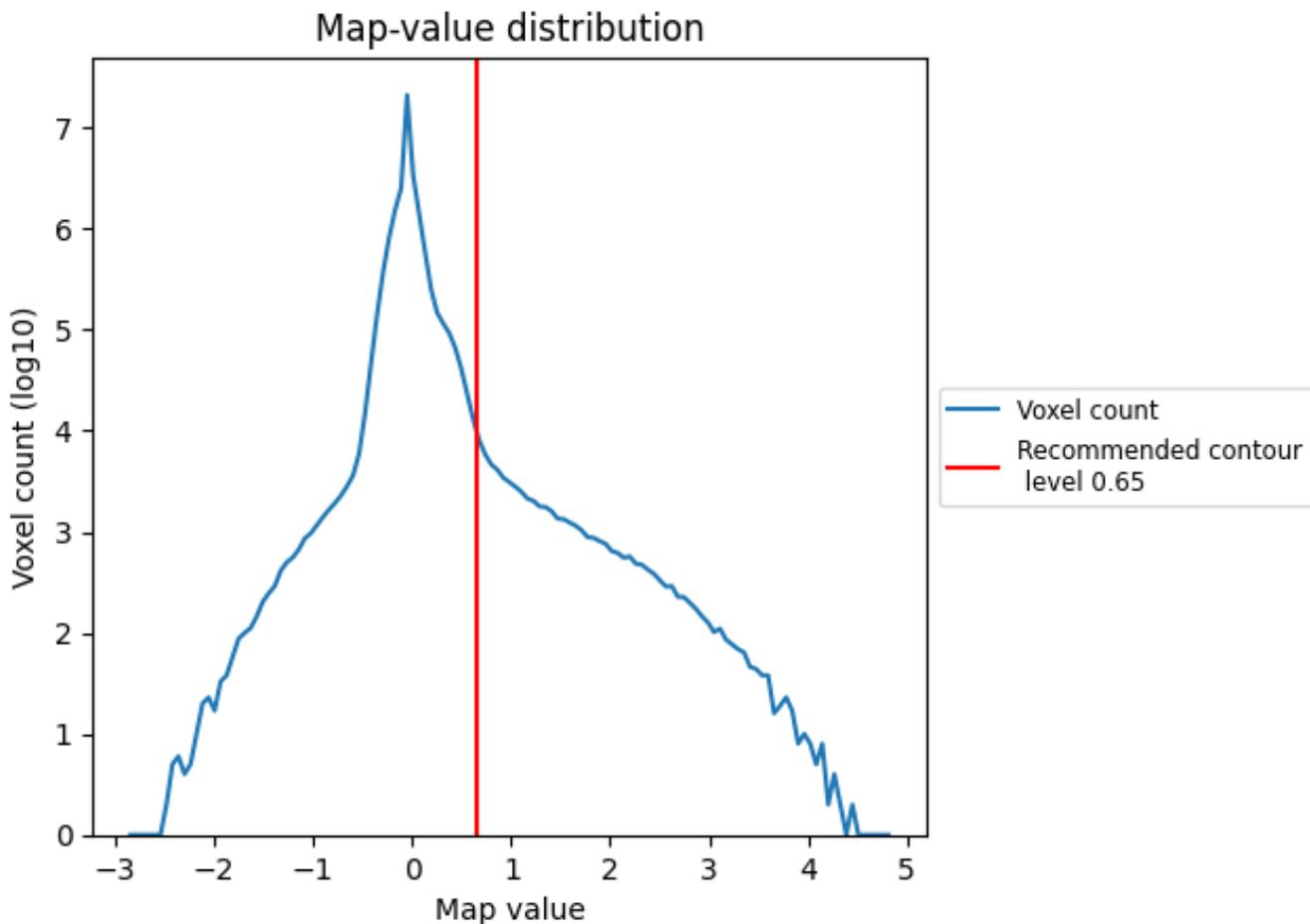


The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

## 7.2 Volume estimate ⓘ
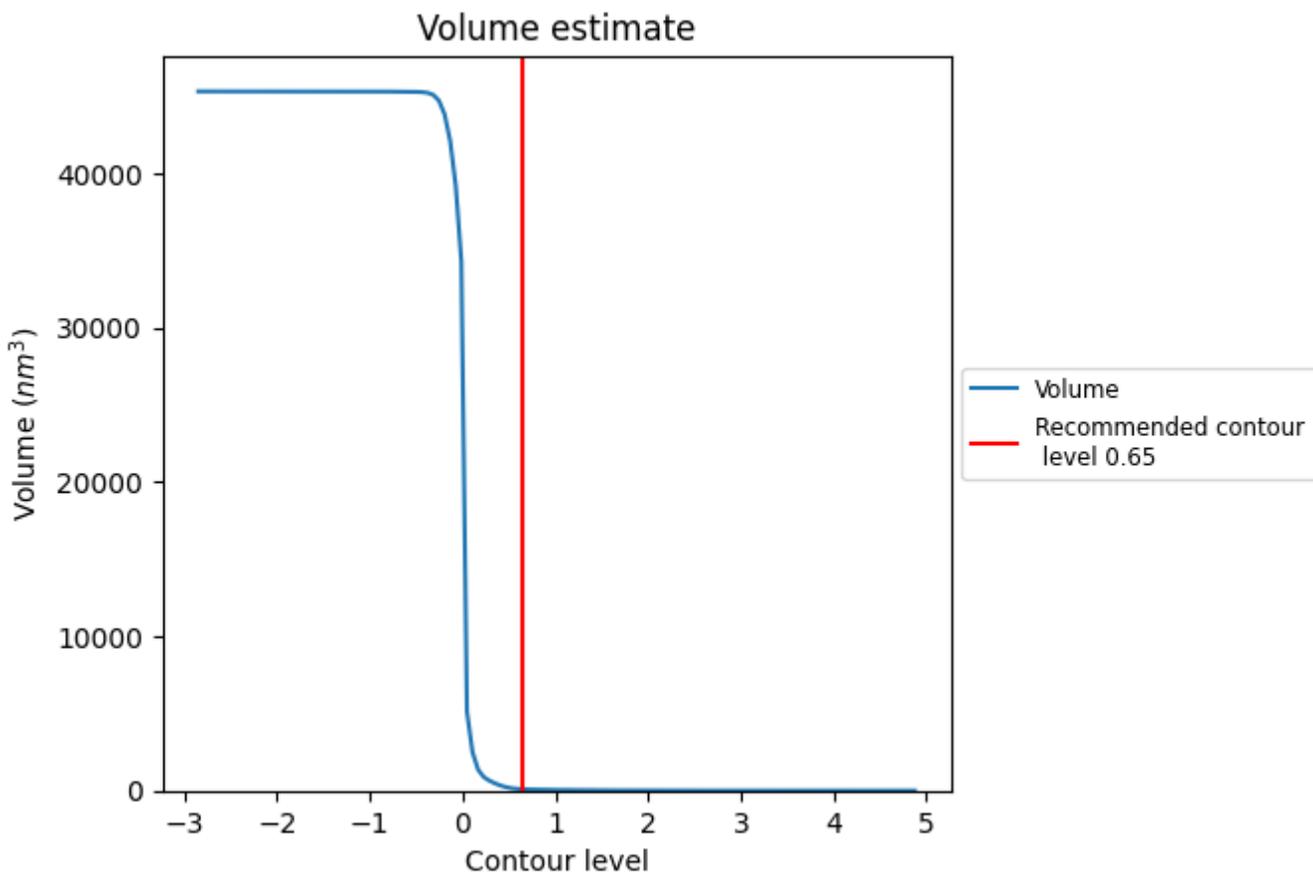


The volume at the recommended contour level is 90 nm$^3$; this corresponds to an approximate mass of 81 kDa.

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 (i)
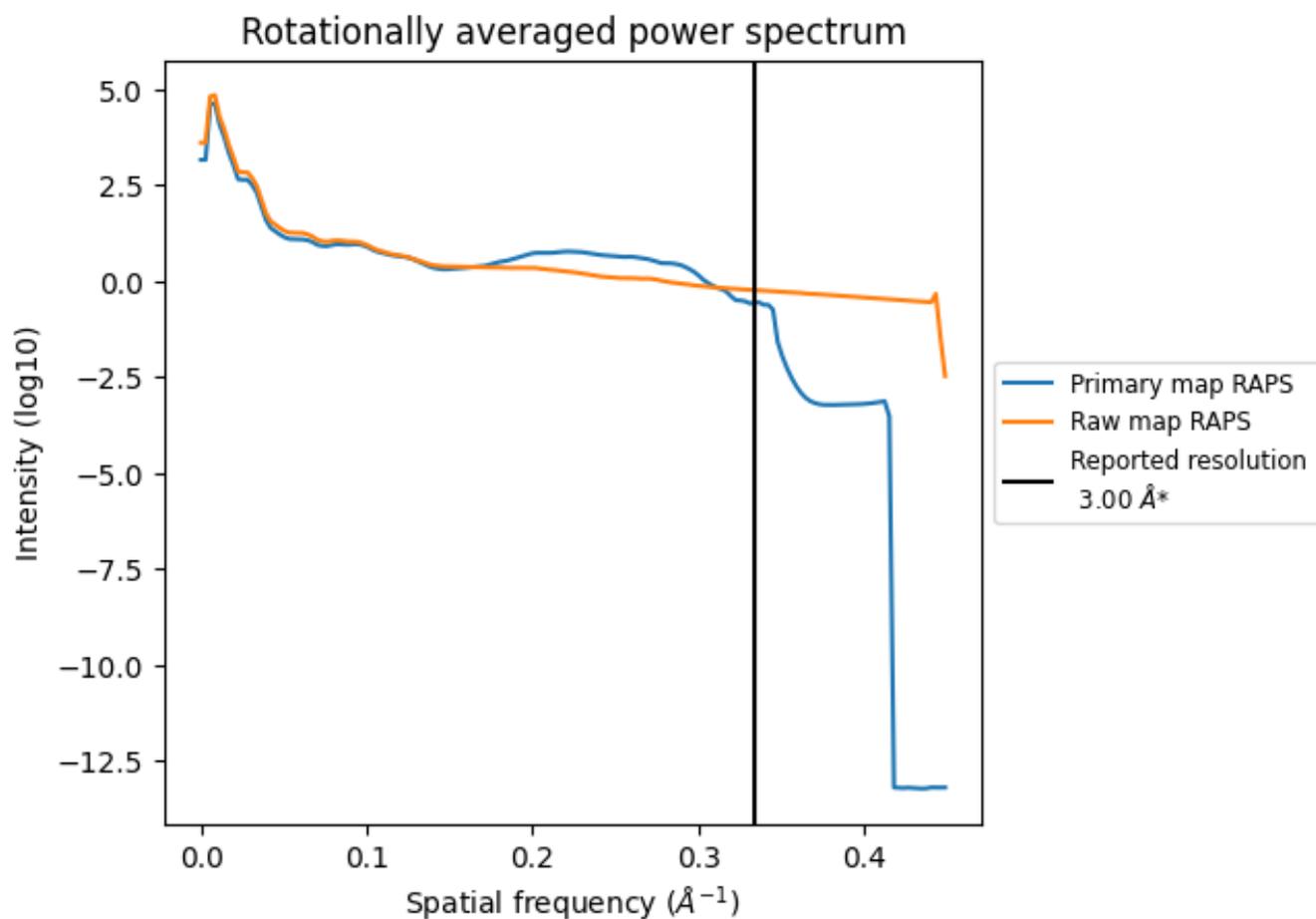


*Reported resolution corresponds to spatial frequency of 0.333 Å$^{-1}$

# 8    Fourier-Shell correlation ⓘ

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. 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. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

## 8.1    FSC ⓘ
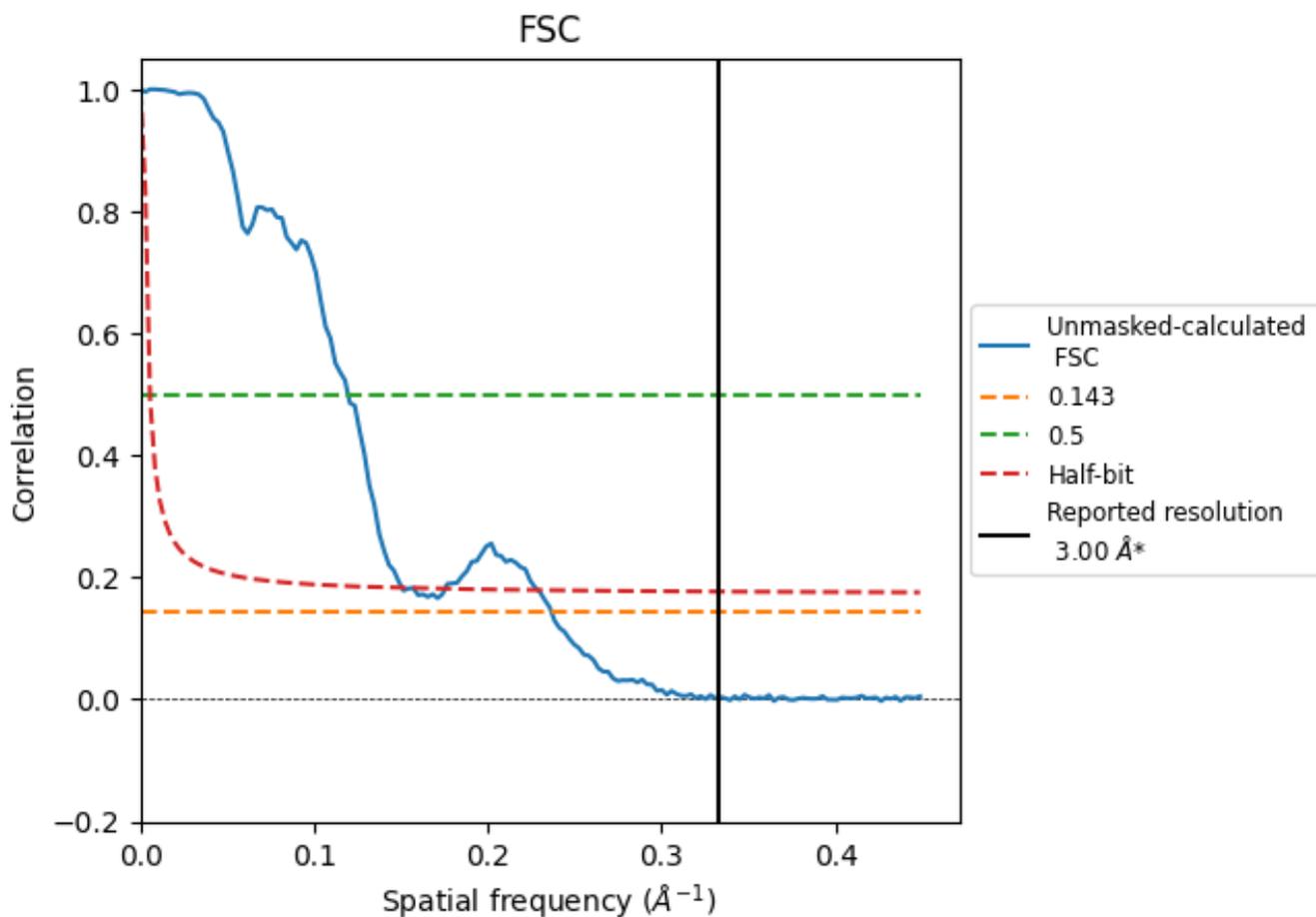


*Reported resolution corresponds to spatial frequency of 0.333 Å$^{-1}$

## 8.2 Resolution estimates (i)

| Resolution estimate (Å) | Estimation criterion (FSC cut-off) | | |
|---|---|---|---|
| | 0.143 | 0.5 | Half-bit |
| Reported by author | - | - | - |
| Author-provided FSC curve | - | - | - |
| Unmasked-calculated* | 4.23 | 8.37 | 6.64 |

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

# 9 Map-model fit (i)

This section contains information regarding the fit between EMDB map EMD-67990 and PDB model 21TP. Per-residue inclusion information can be found in section 3 on page 9.

## 9.1 Map-model overlay (i)



| X | Y | Z |
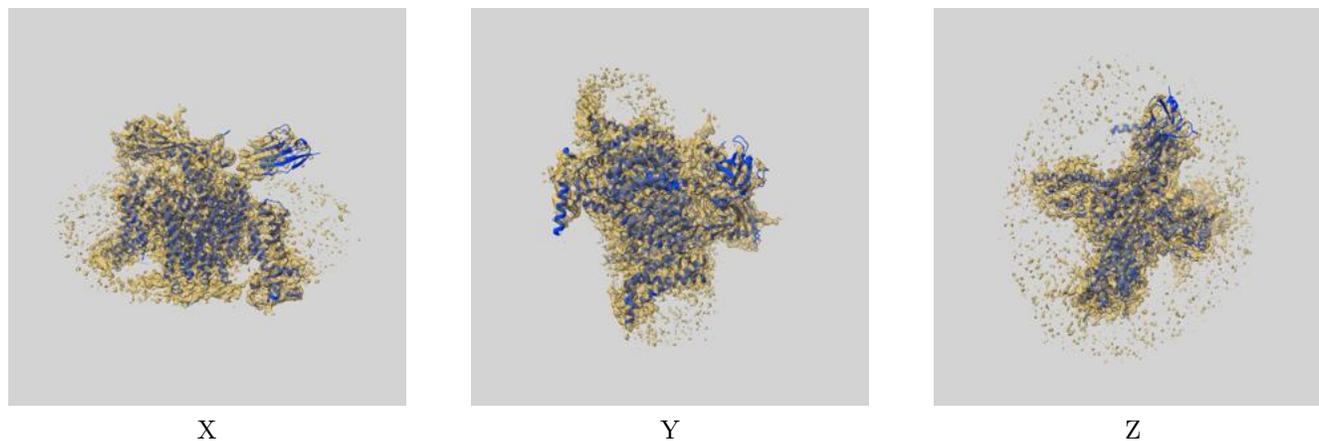
The images above show the 3D surface view of the map at the recommended contour level 0.65 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model ⓘ



X                           Y                           Z
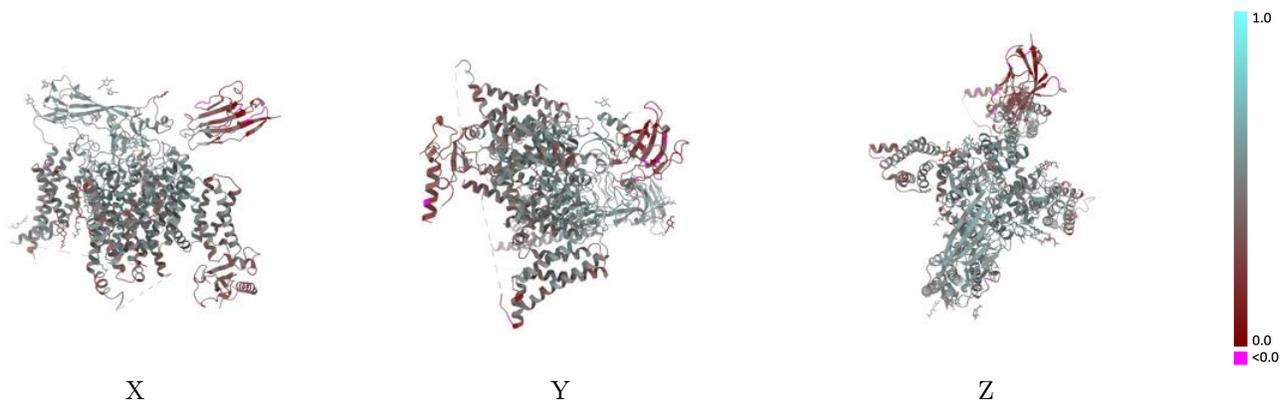
The images above show the model with each residue coloured according its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

## 9.3 Atom inclusion mapped to coordinate model ⓘ



X                           Y                           Z
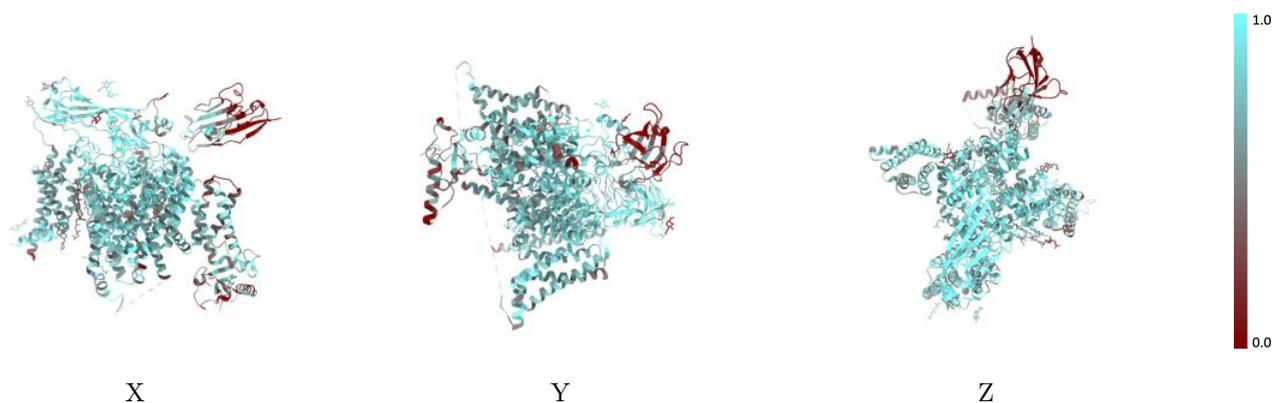
The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.65).

## 9.4 Atom inclusion ⓘ
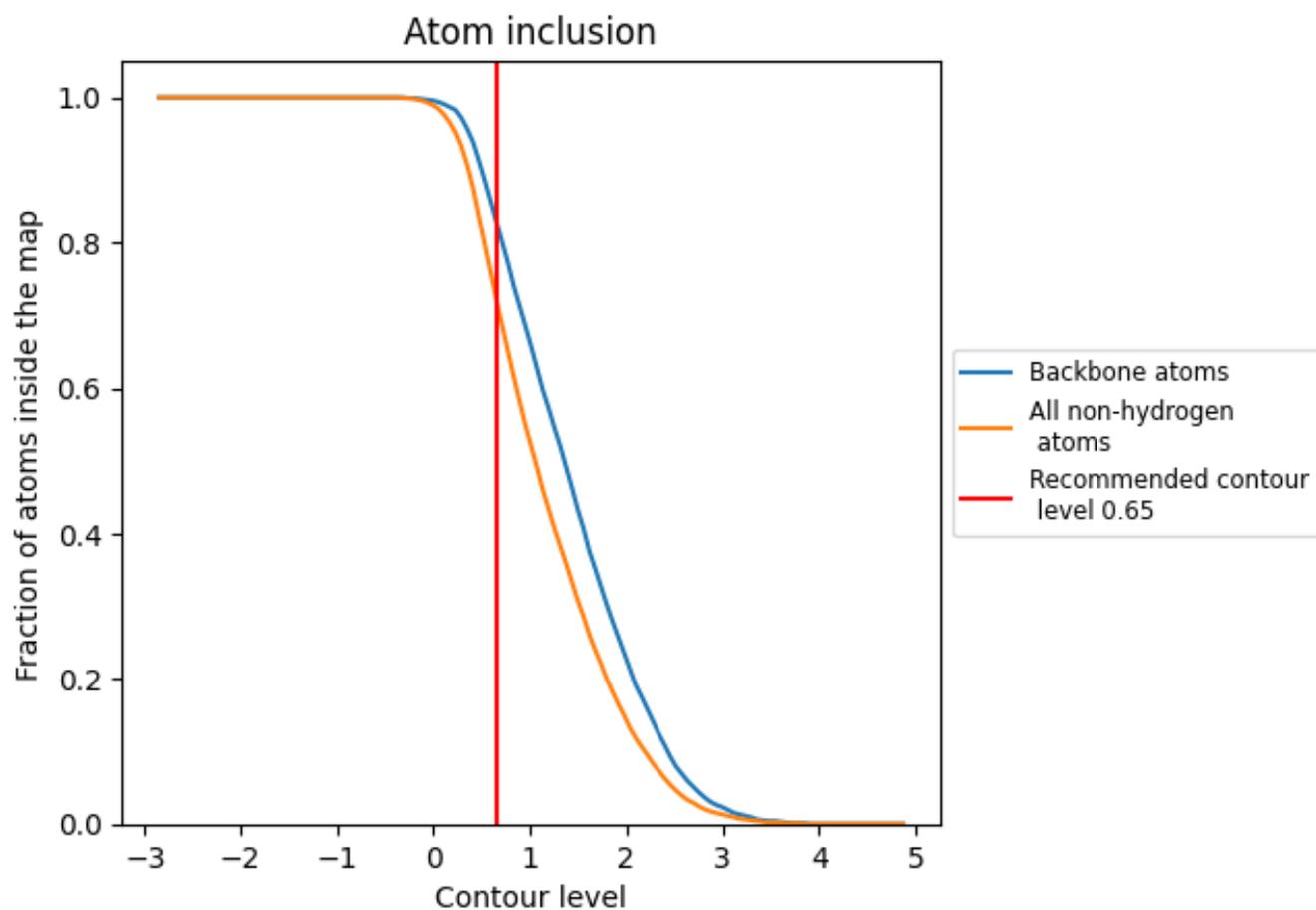
Atom inclusion



At the recommended contour level, 83% of all backbone atoms, 72% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.65) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion | Q-score |
|:-----:|:--------------:|:-------:|
| All | 0.7220 | 0.4670 |
| A | 0.7490 | 0.4750 |
| B | 0.8030 | 0.5160 |
| C | 0.3260 | 0.3020 |
| D | 0.6430 | 0.4600 |
| E | 0.8570 | 0.5430 |

1.0

0.0
<0.0