



## Full wwPDB EM Validation Report ⓘ

Jul 15, 2025 – 11:39 AM JST

PDB ID : 8ZHN / pdb\_00008zhn  
EMDB ID : EMD-60109  
Title : SARS-CoV-2 spike trimer (6P) in complex with three H18 and three R1-32 Fabs (one RBD rotated)  
Authors : Yan, Q.; Gao, X.; Liu, B.; Hou, R.; He, P.; Li, Z.; Chen, Q.; Wang, J.; He, J.; Chen, L.; Zhao, J.; Xiong, X.  
Deposited on : 2024-05-11  
Resolution : 4.12 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](mailto: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 : **FAILED**  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4-5-2 with Phenix2.0rc1  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : **FAILED**  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.44

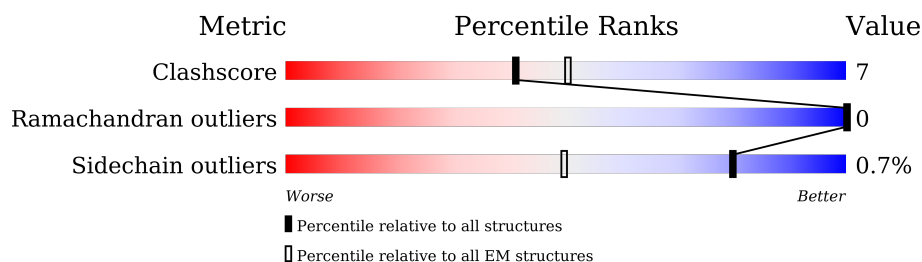
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 4.12 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.



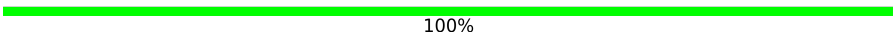
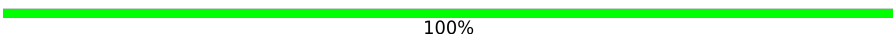
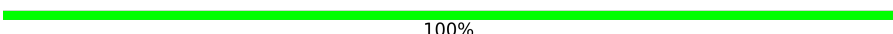
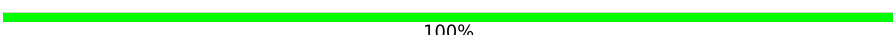
| Metric                | Whole archive<br>(#Entries) | EM structures<br>(#Entries) |
|-----------------------|-----------------------------|-----------------------------|
| Clashscore            | 210492                      | 15764                       |
| Ramachandran outliers | 207382                      | 16835                       |
| Sidechain outliers    | 206894                      | 16415                       |

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  $\geq 3$ , 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  $\leq 5\%$ .

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1   | A     | 1278   |                  |
| 1   | B     | 1278   |                  |
| 1   | C     | 1278   |                  |
| 2   | G     | 228    |                  |
| 2   | H     | 228    |                  |
| 2   | N     | 228    |                  |
| 3   | I     | 214    |                  |
| 3   | L     | 214    |                  |
| 3   | O     | 214    |                  |

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| Mol | Chain | Length | Quality of chain                                                                     |
|-----|-------|--------|--------------------------------------------------------------------------------------|
| 4   | D     | 243    |    |
| 4   | F     | 243    |    |
| 4   | K     | 243    |    |
| 5   | E     | 243    |    |
| 5   | J     | 243    |    |
| 5   | M     | 243    |    |
| 6   | P     | 2      |    |
| 6   | Q     | 2      |    |
| 6   | R     | 2      |    |
| 6   | S     | 2      |    |
| 6   | T     | 2      |    |
| 6   | U     | 2      |   |
| 6   | V     | 2      |  |
| 6   | W     | 2      |  |
| 6   | X     | 2      |  |
| 6   | Y     | 2      |  |
| 6   | Z     | 2      |  |
| 6   | a     | 2      |  |

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 45273 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 Spike glycoprotein,Fibritin,Expression Tag.

| Mol | Chain | Residues | Atoms |      |      |      |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|----|---------|-------|
| 1   | C     | 1066     | Total | C    | N    | O    | S  | 0       | 0     |
|     |       |          | 8344  | 5324 | 1394 | 1588 | 38 |         |       |
| 1   | A     | 1066     | Total | C    | N    | O    | S  | 0       | 0     |
|     |       |          | 8344  | 5324 | 1394 | 1588 | 38 |         |       |
| 1   | B     | 1066     | Total | C    | N    | O    | S  | 0       | 0     |
|     |       |          | 8344  | 5324 | 1394 | 1588 | 38 |         |       |

There are 33 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference  |
|-------|---------|----------|--------|----------|------------|
| C     | 682     | GLY      | ARG    | conflict | UNP P0DTC2 |
| C     | 683     | SER      | ARG    | conflict | UNP P0DTC2 |
| C     | 685     | SER      | ARG    | conflict | UNP P0DTC2 |
| C     | 817     | PRO      | PHE    | conflict | UNP P0DTC2 |
| C     | 892     | PRO      | ALA    | conflict | UNP P0DTC2 |
| C     | 899     | PRO      | ALA    | conflict | UNP P0DTC2 |
| C     | 942     | PRO      | ALA    | conflict | UNP P0DTC2 |
| C     | 986     | PRO      | LYS    | variant  | UNP P0DTC2 |
| C     | 987     | PRO      | VAL    | variant  | UNP P0DTC2 |
| C     | 1209    | GLY      | -      | linker   | UNP P0DTC2 |
| C     | 1210    | SER      | -      | linker   | UNP P0DTC2 |
| A     | 682     | GLY      | ARG    | conflict | UNP P0DTC2 |
| A     | 683     | SER      | ARG    | conflict | UNP P0DTC2 |
| A     | 685     | SER      | ARG    | conflict | UNP P0DTC2 |
| A     | 817     | PRO      | PHE    | conflict | UNP P0DTC2 |
| A     | 892     | PRO      | ALA    | conflict | UNP P0DTC2 |
| A     | 899     | PRO      | ALA    | conflict | UNP P0DTC2 |
| A     | 942     | PRO      | ALA    | conflict | UNP P0DTC2 |
| A     | 986     | PRO      | LYS    | variant  | UNP P0DTC2 |
| A     | 987     | PRO      | VAL    | variant  | UNP P0DTC2 |
| A     | 1209    | GLY      | -      | linker   | UNP P0DTC2 |
| A     | 1210    | SER      | -      | linker   | UNP P0DTC2 |
| B     | 682     | GLY      | ARG    | conflict | UNP P0DTC2 |
| B     | 683     | SER      | ARG    | conflict | UNP P0DTC2 |

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| Chain | Residue | Modelled | Actual | Comment  | Reference  |
|-------|---------|----------|--------|----------|------------|
| B     | 685     | SER      | ARG    | conflict | UNP P0DTC2 |
| B     | 817     | PRO      | PHE    | conflict | UNP P0DTC2 |
| B     | 892     | PRO      | ALA    | conflict | UNP P0DTC2 |
| B     | 899     | PRO      | ALA    | conflict | UNP P0DTC2 |
| B     | 942     | PRO      | ALA    | conflict | UNP P0DTC2 |
| B     | 986     | PRO      | LYS    | variant  | UNP P0DTC2 |
| B     | 987     | PRO      | VAL    | variant  | UNP P0DTC2 |
| B     | 1209    | GLY      | -      | linker   | UNP P0DTC2 |
| B     | 1210    | SER      | -      | linker   | UNP P0DTC2 |

- Molecule 2 is a protein called Heavy chain of R1-32 Fab.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 2   | G     | 227      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1661  | 1045 | 277 | 332 | 7 |         |       |
| 2   | H     | 227      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1661  | 1045 | 277 | 332 | 7 |         |       |
| 2   | N     | 227      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1661  | 1045 | 277 | 332 | 7 |         |       |

- Molecule 3 is a protein called Light chain of R1-32 Fab.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 3   | I     | 213      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1557  | 971 | 261 | 321 | 4 |         |       |
| 3   | L     | 213      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1557  | 971 | 261 | 321 | 4 |         |       |
| 3   | O     | 213      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1557  | 971 | 261 | 321 | 4 |         |       |

- Molecule 4 is a protein called Light chain of H18 Fab.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 4   | D     | 213      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1593  | 989 | 264 | 335 | 5 |         |       |
| 4   | F     | 213      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1593  | 989 | 264 | 335 | 5 |         |       |
| 4   | K     | 213      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1593  | 989 | 264 | 335 | 5 |         |       |

- Molecule 5 is a protein called Heavy chain of H18 Fab.

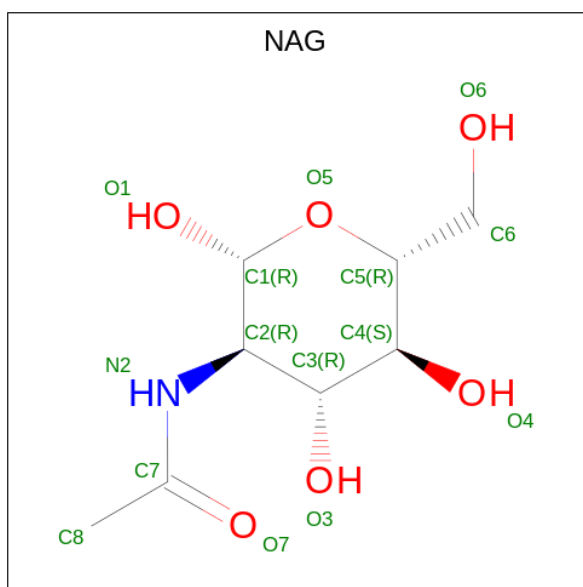
| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 5   | E     | 224      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1670  | 1058 | 276 | 330 | 6 |         |       |
| 5   | J     | 224      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1670  | 1058 | 276 | 330 | 6 |         |       |
| 5   | M     | 224      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1670  | 1058 | 276 | 330 | 6 |         |       |

- Molecule 6 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



| Mol | Chain | Residues | Atoms |    |   |    | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|-------|
| 6   | P     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | Q     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | R     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | S     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | T     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | U     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | V     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | W     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | X     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | Y     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | Z     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |
| 6   | a     | 2        | Total | C  | N | O  | 0       | 0     |
|     |       |          | 28    | 16 | 2 | 10 |         |       |

- Molecule 7 is 2-acetamido-2-deoxy-beta-D-glucopyranose (CCD ID: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).



| Mol | Chain | Residues | Atoms |   |   |   | AltConf |
|-----|-------|----------|-------|---|---|---|---------|
| 7   | C     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | C     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | C     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | C     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | C     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | C     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | C     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | C     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | C     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | A     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | A     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |
| 7   | A     | 1        | Total | C | N | O | 0       |
|     |       |          | 14    | 8 | 1 | 5 |         |

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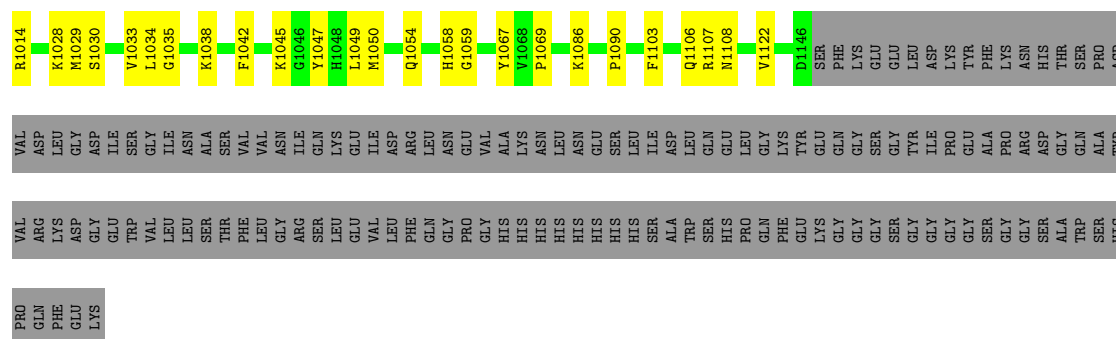
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| Mol | Chain | Residues | Atoms       |        |        |        | AltConf |
|-----|-------|----------|-------------|--------|--------|--------|---------|
| 7   | A     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | A     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | A     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | A     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | A     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | A     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | A     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | A     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |
| 7   | B     | 1        | Total<br>14 | C<br>8 | N<br>1 | O<br>5 | 0       |



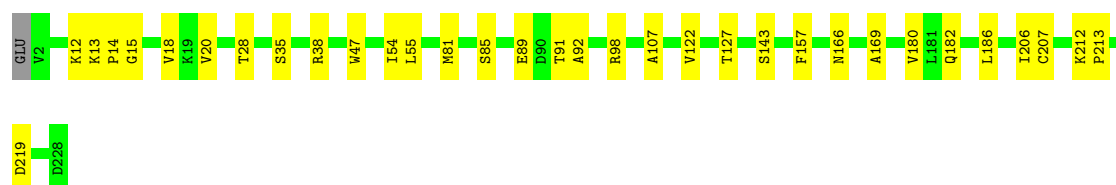






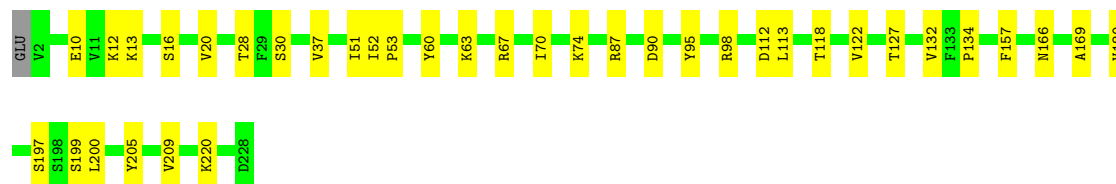
- Molecule 2: Heavy chain of R1-32 Fab

Chain G: 85% 14%



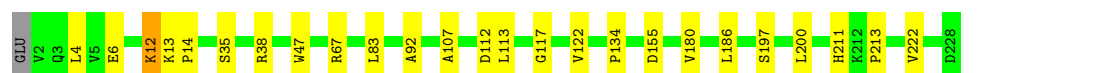
- Molecule 2: Heavy chain of R1-32 Fab

Chain H: 83% 16%



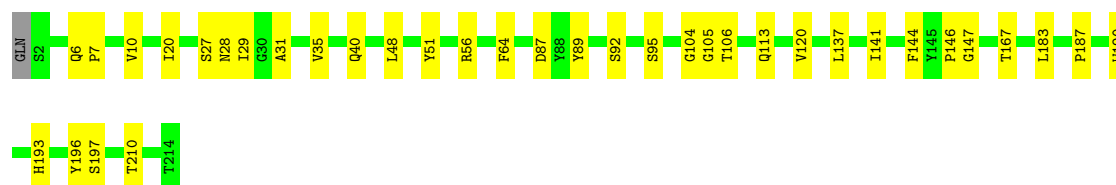
- Molecule 2: Heavy chain of R1-32 Fab

Chain N: 89% 11%



- Molecule 3: Light chain of R1-32 Fab

Chain I: 83% 17%



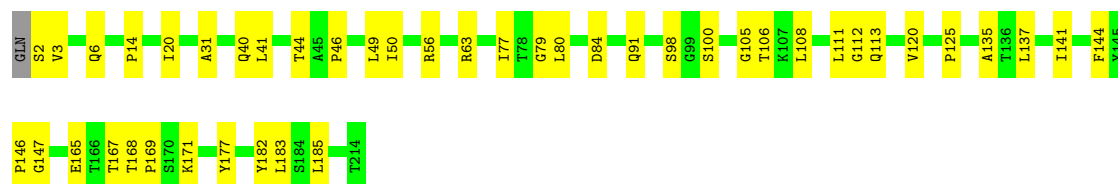
- Molecule 3: Light chain of R1-32 Fab

Chain L:  85% 14%



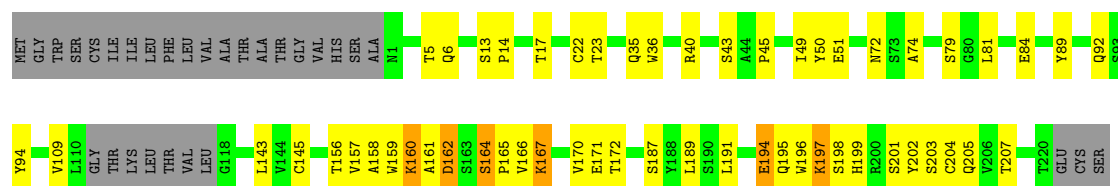
- Molecule 3: Light chain of R1-32 Fab

Chain O:  79% 21%



- Molecule 4: Light chain of H18 Fab

Chain D:  65% 20% 12%



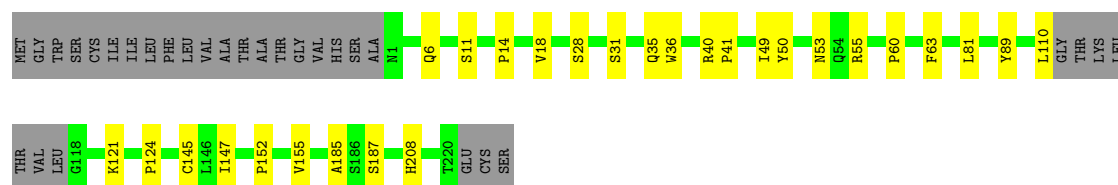
- Molecule 4: Light chain of H18 Fab

Chain F:  77% 11% 12%



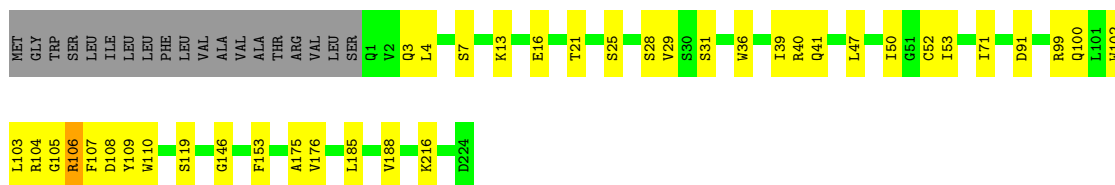
- Molecule 4: Light chain of H18 Fab

Chain K:  76% 12% 12%



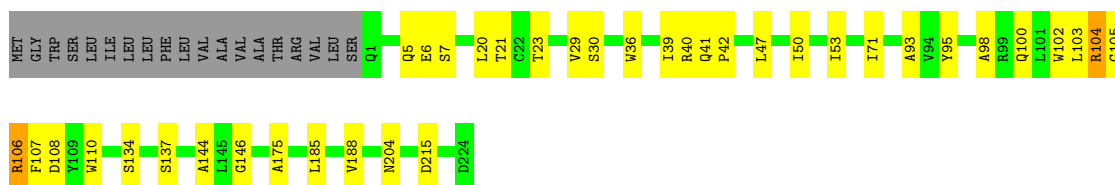
- Molecule 5: Heavy chain of H18 Fab

Chain E:  76% 16% 8%



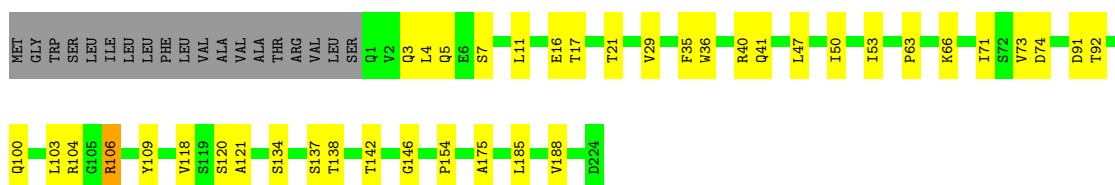
- Molecule 5: Heavy chain of H18 Fab

Chain J:  77% 15% 8%



- Molecule 5: Heavy chain of H18 Fab

Chain M:  76% 16% 8%

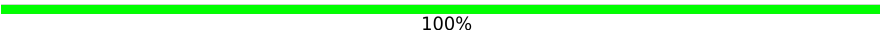


- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain P:  50% 50%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Q:  100%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain R:  50% 50%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain S:  100%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain T:  100%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain U:  100%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain V:  100%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain W:  100%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain X:  50% 50%



- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Y:  100%

MAG1  
MAG2

- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain Z:  50% 50%

MAG1  
MAG2

- Molecule 6: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain a:  100%

MAG1  
MAG2

## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 13185                                   | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | FEI TITAN KRIOS                         | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 50                                      | Depositor |
| Minimum defocus (nm)                 | 600                                     | Depositor |
| Maximum defocus (nm)                 | 2000                                    | Depositor |
| Magnification                        | 130000                                  | Depositor |
| Image detector                       | FEI FALCON IV (4k x 4k)                 | Depositor |



## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: NAG

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     | 0.14         | 0/8540  | 0.34        | 0/11624 |
| 1   | B     | 0.13         | 0/8540  | 0.33        | 0/11624 |
| 1   | C     | 0.19         | 0/8540  | 0.36        | 0/11624 |
| 2   | G     | 0.12         | 0/1698  | 0.33        | 0/2312  |
| 2   | H     | 0.14         | 0/1698  | 0.35        | 0/2312  |
| 2   | N     | 0.13         | 0/1698  | 0.35        | 0/2312  |
| 3   | I     | 0.12         | 0/1595  | 0.31        | 0/2181  |
| 3   | L     | 0.14         | 0/1595  | 0.32        | 0/2181  |
| 3   | O     | 0.13         | 0/1595  | 0.34        | 0/2181  |
| 4   | D     | 0.17         | 0/1630  | 0.45        | 0/2225  |
| 4   | F     | 0.14         | 0/1630  | 0.36        | 0/2225  |
| 4   | K     | 0.13         | 0/1630  | 0.33        | 0/2225  |
| 5   | E     | 0.15         | 0/1713  | 0.41        | 0/2339  |
| 5   | J     | 0.13         | 0/1713  | 0.36        | 0/2339  |
| 5   | M     | 0.12         | 0/1713  | 0.36        | 0/2339  |
| All | All   | 0.15         | 0/45528 | 0.35        | 0/62043 |

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 [i](#)

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     | 8344  | 0        | 8122     | 119     | 0            |
| 1   | B     | 8344  | 0        | 8123     | 125     | 0            |
| 1   | C     | 8344  | 0        | 8123     | 105     | 0            |
| 2   | G     | 1661  | 0        | 1631     | 19      | 0            |
| 2   | H     | 1661  | 0        | 1631     | 21      | 0            |
| 2   | N     | 1661  | 0        | 1631     | 18      | 0            |
| 3   | I     | 1557  | 0        | 1498     | 22      | 0            |
| 3   | L     | 1557  | 0        | 1498     | 19      | 0            |
| 3   | O     | 1557  | 0        | 1498     | 28      | 0            |
| 4   | D     | 1593  | 0        | 1524     | 47      | 0            |
| 4   | F     | 1593  | 0        | 1524     | 18      | 0            |
| 4   | K     | 1593  | 0        | 1524     | 20      | 0            |
| 5   | E     | 1670  | 0        | 1643     | 32      | 0            |
| 5   | J     | 1670  | 0        | 1643     | 28      | 0            |
| 5   | M     | 1670  | 0        | 1643     | 30      | 0            |
| 6   | P     | 28    | 0        | 25       | 1       | 0            |
| 6   | Q     | 28    | 0        | 25       | 0       | 0            |
| 6   | R     | 28    | 0        | 25       | 1       | 0            |
| 6   | S     | 28    | 0        | 25       | 0       | 0            |
| 6   | T     | 28    | 0        | 25       | 0       | 0            |
| 6   | U     | 28    | 0        | 25       | 0       | 0            |
| 6   | V     | 28    | 0        | 25       | 0       | 0            |
| 6   | W     | 28    | 0        | 25       | 0       | 0            |
| 6   | X     | 28    | 0        | 25       | 1       | 0            |
| 6   | Y     | 28    | 0        | 25       | 0       | 0            |
| 6   | Z     | 28    | 0        | 25       | 1       | 0            |
| 6   | a     | 28    | 0        | 25       | 0       | 0            |
| 7   | A     | 154   | 0        | 143      | 1       | 0            |
| 7   | B     | 154   | 0        | 143      | 0       | 0            |
| 7   | C     | 154   | 0        | 143      | 2       | 0            |
| All | All   | 45273 | 0        | 43985    | 593     | 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 7.

All (593) 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) |
|------------------|------------------|--------------------------|-------------------|
| 2:N:12:LYS:O     | 2:N:122:VAL:HG23 | 1.48                     | 1.11              |
| 5:E:99:ARG:HB3   | 5:E:109:TYR:HB2  | 1.54                     | 0.89              |
| 2:N:13:LYS:HG3   | 2:N:14:PRO:HD2   | 1.53                     | 0.89              |
| 1:B:335:LEU:HD23 | 1:B:364:ASP:H    | 1.40                     | 0.87              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 4:K:35:GLN:HG2   | 5:M:106:ARG:HB3  | 1.57                     | 0.86              |
| 5:M:4:LEU:HB2    | 5:M:109:TYR:HE2  | 1.42                     | 0.85              |
| 5:E:102:TRP:HB3  | 5:E:105:GLY:HA3  | 1.58                     | 0.84              |
| 4:F:47:THR:HG21  | 5:J:106:ARG:HG3  | 1.62                     | 0.80              |
| 4:D:161:ALA:HA   | 4:D:167:LYS:HG2  | 1.65                     | 0.78              |
| 1:C:329:PHE:HE1  | 1:C:523:THR:O    | 1.66                     | 0.78              |
| 1:B:106:PHE:HB2  | 1:B:117:LEU:HB2  | 1.65                     | 0.77              |
| 1:C:57:PRO:HB2   | 1:C:60:SER:HB3   | 1.68                     | 0.74              |
| 4:D:35:GLN:HG2   | 5:E:106:ARG:HG3  | 1.68                     | 0.73              |
| 1:C:398:ASP:HB3  | 1:C:512:VAL:HB   | 1.69                     | 0.73              |
| 1:C:356:LYS:HB2  | 1:C:397:ALA:HB3  | 1.70                     | 0.73              |
| 5:E:119:SER:HB2  | 5:E:153:PHE:HZ   | 1.55                     | 0.71              |
| 1:A:667:GLY:HA2  | 1:B:864:LEU:HA   | 1.74                     | 0.70              |
| 1:A:110:LEU:CD1  | 1:A:135:PHE:HB2  | 2.22                     | 0.69              |
| 4:D:158:ALA:HB3  | 4:D:205:GLN:HB2  | 1.75                     | 0.69              |
| 1:C:328:ARG:HD2  | 1:C:580:GLN:HE21 | 1.57                     | 0.68              |
| 1:C:106:PHE:HB2  | 1:C:117:LEU:HB2  | 1.76                     | 0.68              |
| 1:C:329:PHE:CE1  | 1:C:523:THR:O    | 2.46                     | 0.68              |
| 4:D:145:CYS:HB3  | 4:D:187:SER:HB3  | 1.74                     | 0.68              |
| 1:B:979:ASP:OD2  | 1:B:983:ARG:NH1  | 2.27                     | 0.67              |
| 5:M:146:GLY:HA3  | 5:M:188:VAL:HG12 | 1.75                     | 0.66              |
| 3:O:63:ARG:NH2   | 3:O:79:GLY:O     | 2.29                     | 0.66              |
| 5:M:29:VAL:HG13  | 5:M:36:TRP:HE1   | 1.59                     | 0.66              |
| 4:K:145:CYS:HB3  | 4:K:187:SER:HB3  | 1.78                     | 0.66              |
| 5:E:146:GLY:HA3  | 5:E:188:VAL:HG12 | 1.78                     | 0.65              |
| 1:B:339:GLY:HA2  | 1:B:342:PHE:HD2  | 1.62                     | 0.65              |
| 4:F:62:ARG:NH2   | 4:F:85:ASP:OD1   | 2.30                     | 0.65              |
| 4:D:40:ARG:HB2   | 4:D:43:SER:HB2   | 1.79                     | 0.64              |
| 3:I:7:PRO:O      | 3:I:106:THR:HG22 | 1.97                     | 0.64              |
| 5:M:35:PHE:HB2   | 5:M:100:GLN:HB3  | 1.80                     | 0.64              |
| 5:M:4:LEU:HB2    | 5:M:109:TYR:CE2  | 2.29                     | 0.64              |
| 1:B:903:ALA:HB1  | 1:B:913:GLN:HB2  | 1.80                     | 0.64              |
| 1:B:335:LEU:HB3  | 1:B:363:ALA:CB   | 2.28                     | 0.63              |
| 1:C:328:ARG:HG3  | 1:C:579:PRO:HD2  | 1.79                     | 0.63              |
| 2:N:6:GLU:OE2    | 2:N:117:GLY:N    | 2.29                     | 0.63              |
| 1:B:730:SER:HB3  | 1:B:1058:HIS:HA  | 1.80                     | 0.63              |
| 1:B:442:ASP:O    | 1:B:448:ASN:ND2  | 2.32                     | 0.63              |
| 4:D:35:GLN:CG    | 5:E:106:ARG:HG3  | 2.29                     | 0.62              |
| 1:B:117:LEU:HD13 | 1:B:130:VAL:HB   | 1.81                     | 0.62              |
| 1:B:342:PHE:HD1  | 1:B:511:VAL:HG11 | 1.64                     | 0.62              |
| 3:I:6:GLN:HB2    | 3:I:104:GLY:H    | 1.64                     | 0.62              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 4:D:194:GLU:HA   | 4:D:197:LYS:HD2   | 1.81                     | 0.62              |
| 3:I:137:LEU:HD12 | 3:I:183:LEU:HD23  | 1.82                     | 0.62              |
| 4:D:165:PRO:HD3  | 4:D:199:HIS:CD2   | 2.35                     | 0.62              |
| 1:A:742:ILE:O    | 1:A:1000:ARG:NH1  | 2.32                     | 0.62              |
| 5:J:41:GLN:HB2   | 5:J:47:LEU:HD23   | 1.82                     | 0.61              |
| 1:A:106:PHE:HB2  | 1:A:117:LEU:HB2   | 1.82                     | 0.61              |
| 1:B:64:TRP:HE1   | 1:B:264:ALA:HB1   | 1.66                     | 0.61              |
| 2:H:28:THR:O     | 2:H:98:ARG:NH1    | 2.34                     | 0.61              |
| 1:C:108:THR:O    | 1:C:237:ARG:NH1   | 2.34                     | 0.61              |
| 4:D:165:PRO:HD3  | 4:D:199:HIS:HD2   | 1.66                     | 0.61              |
| 1:C:742:ILE:O    | 1:C:1000:ARG:NH1  | 2.35                     | 0.60              |
| 1:C:369:TYR:HH   | 5:E:102:TRP:CD1   | 2.20                     | 0.60              |
| 2:H:10:GLU:OE2   | 2:H:12:LYS:NZ     | 2.34                     | 0.60              |
| 4:K:40:ARG:HE    | 4:K:41:PRO:HD2    | 1.65                     | 0.60              |
| 1:A:110:LEU:HD12 | 1:A:110:LEU:O     | 2.01                     | 0.60              |
| 1:A:173:GLN:HE22 | 1:A:175:PHE:HD2   | 1.50                     | 0.59              |
| 1:B:99:ASN:O     | 1:B:102:ARG:NH1   | 2.34                     | 0.59              |
| 1:A:57:PRO:HB2   | 1:A:60:SER:HB3    | 1.84                     | 0.59              |
| 3:O:125:PRO:HD3  | 3:O:137:LEU:HD13  | 1.84                     | 0.59              |
| 1:A:246:ARG:HH22 | 1:A:254:SER:HB3   | 1.67                     | 0.59              |
| 2:H:112:ASP:HA   | 3:L:48:LEU:HB2    | 1.85                     | 0.59              |
| 1:C:535:LYS:C    | 1:C:537:LYS:H     | 2.11                     | 0.59              |
| 1:C:861:LEU:HD12 | 1:C:862:PRO:HD2   | 1.85                     | 0.59              |
| 4:F:28:SER:HG    | 4:F:31:SER:HG     | 1.50                     | 0.58              |
| 5:J:39:ILE:HD11  | 5:J:107:PHE:CZ    | 2.37                     | 0.58              |
| 1:A:861:LEU:HD12 | 1:A:862:PRO:HD2   | 1.85                     | 0.58              |
| 4:F:35:GLN:HG2   | 5:J:106:ARG:HB3   | 1.84                     | 0.58              |
| 5:M:3:GLN:HE22   | 5:M:5:GLN:HB3     | 1.68                     | 0.58              |
| 3:O:91:GLN:HE21  | 3:O:100:SER:HB3   | 1.69                     | 0.58              |
| 5:M:175:ALA:HB2  | 5:M:185:LEU:HD23  | 1.84                     | 0.58              |
| 5:E:99:ARG:HD3   | 5:E:109:TYR:CD1   | 2.39                     | 0.58              |
| 1:A:110:LEU:HD12 | 1:A:135:PHE:HB2   | 1.86                     | 0.58              |
| 1:B:912:THR:HG21 | 1:B:1106:GLN:HE21 | 1.68                     | 0.58              |
| 1:B:922:LEU:HD11 | 6:X:1:NAG:H3      | 1.85                     | 0.58              |
| 4:D:195:GLN:HA   | 4:D:198:SER:HB3   | 1.83                     | 0.58              |
| 2:G:28:THR:O     | 2:G:98:ARG:NH1    | 2.37                     | 0.58              |
| 1:B:277:LEU:HD12 | 1:B:285:ILE:HD12  | 1.85                     | 0.58              |
| 1:A:110:LEU:HD13 | 1:A:135:PHE:HB2   | 1.86                     | 0.57              |
| 4:F:14:PRO:HA    | 4:F:81:LEU:HB3    | 1.85                     | 0.57              |
| 5:M:40:ARG:NH1   | 5:M:91:ASP:OD1    | 2.37                     | 0.57              |
| 1:C:64:TRP:HE1   | 1:C:264:ALA:HB1   | 1.68                     | 0.57              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 4:D:170:VAL:HG22 | 4:D:189:LEU:HD13  | 1.85                     | 0.57              |
| 5:J:40:ARG:HB3   | 5:J:50:ILE:HD11   | 1.87                     | 0.57              |
| 1:C:142:GLY:HA3  | 1:C:156:GLU:HB2   | 1.86                     | 0.57              |
| 1:B:1047:TYR:HB2 | 1:B:1067:TYR:HB3  | 1.86                     | 0.57              |
| 1:C:765:ARG:NH1  | 1:B:957:GLN:OE1   | 2.36                     | 0.57              |
| 2:G:38:ARG:NH2   | 2:G:89:GLU:O      | 2.38                     | 0.57              |
| 5:E:41:GLN:HB2   | 5:E:47:LEU:HD23   | 1.86                     | 0.57              |
| 1:A:442:ASP:O    | 1:A:448:ASN:ND2   | 2.36                     | 0.57              |
| 5:J:175:ALA:HB2  | 5:J:185:LEU:HD23  | 1.85                     | 0.57              |
| 5:M:41:GLN:HB2   | 5:M:47:LEU:HD23   | 1.86                     | 0.57              |
| 1:A:355:ARG:HG3  | 1:A:396:TYR:HE2   | 1.69                     | 0.57              |
| 5:J:146:GLY:HA3  | 5:J:188:VAL:HG12  | 1.86                     | 0.57              |
| 1:B:729:VAL:H    | 1:B:1059:GLY:HA2  | 1.70                     | 0.57              |
| 1:C:770:ILE:HD11 | 1:C:1012:LEU:HD13 | 1.87                     | 0.57              |
| 4:D:191:LEU:HD11 | 4:D:195:GLN:HB3   | 1.86                     | 0.57              |
| 2:N:13:LYS:HG3   | 2:N:14:PRO:CD     | 2.31                     | 0.57              |
| 4:D:165:PRO:HB3  | 4:D:202:TYR:OH    | 2.05                     | 0.56              |
| 1:B:342:PHE:CD1  | 1:B:511:VAL:HG11  | 2.40                     | 0.56              |
| 1:C:47:VAL:HG23  | 1:B:569:ILE:HD12  | 1.85                     | 0.56              |
| 1:C:729:VAL:H    | 1:C:1059:GLY:HA2  | 1.70                     | 0.56              |
| 1:C:948:LEU:HD21 | 1:C:1059:GLY:HA3  | 1.87                     | 0.56              |
| 1:B:1106:GLN:N   | 1:B:1106:GLN:OE1  | 2.39                     | 0.56              |
| 4:D:166:VAL:HB   | 4:D:195:GLN:OE1   | 2.06                     | 0.56              |
| 1:A:729:VAL:H    | 1:A:1059:GLY:HA2  | 1.71                     | 0.56              |
| 1:A:731:MET:HG2  | 1:A:774:GLN:NE2   | 2.21                     | 0.56              |
| 1:C:239:GLN:NE2  | 1:C:240:THR:O     | 2.38                     | 0.56              |
| 1:C:246:ARG:HH22 | 1:C:254:SER:HB3   | 1.70                     | 0.56              |
| 3:L:91:GLN:HE21  | 3:L:100:SER:HB3   | 1.70                     | 0.56              |
| 5:E:7:SER:OG     | 5:E:21:THR:OG1    | 2.23                     | 0.56              |
| 3:I:187:PRO:HA   | 3:I:190:TRP:HB3   | 1.87                     | 0.56              |
| 1:A:352:ALA:HA   | 1:A:466:ARG:HD3   | 1.88                     | 0.56              |
| 1:A:983:ARG:HD2  | 1:A:984:LEU:HG    | 1.88                     | 0.56              |
| 5:J:102:TRP:HB3  | 5:J:105:GLY:HA3   | 1.87                     | 0.56              |
| 1:B:356:LYS:HB2  | 1:B:397:ALA:HB3   | 1.86                     | 0.56              |
| 1:A:905:ARG:NH1  | 1:A:1049:LEU:O    | 2.38                     | 0.56              |
| 1:B:335:LEU:HB3  | 1:B:363:ALA:HB1   | 1.88                     | 0.56              |
| 1:A:126:VAL:HB   | 1:A:172:SER:HB3   | 1.88                     | 0.55              |
| 1:B:24:LEU:HB2   | 1:B:78:ARG:HD3    | 1.88                     | 0.55              |
| 1:B:246:ARG:HH22 | 1:B:254:SER:HB3   | 1.71                     | 0.55              |
| 4:F:119:GLN:HE22 | 4:F:151:TYR:HB2   | 1.70                     | 0.55              |
| 1:A:971:GLY:H    | 1:B:755:GLN:HG2   | 1.71                     | 0.55              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:B:532:ASN:ND2   | 5:J:30:SER:OG     | 2.40                     | 0.55              |
| 4:K:36:TRP:HB2    | 4:K:49:ILE:HG22   | 1.87                     | 0.55              |
| 3:O:135:ALA:HB3   | 3:O:185:LEU:HB2   | 1.89                     | 0.55              |
| 2:G:35:SER:HB2    | 2:G:47:TRP:HE1    | 1.72                     | 0.55              |
| 5:E:52:CYS:SG     | 5:E:100:GLN:NE2   | 2.80                     | 0.55              |
| 1:B:97:LYS:HB2    | 1:B:186:PHE:HA    | 1.88                     | 0.55              |
| 2:G:212:LYS:HG3   | 2:G:213:PRO:HD3   | 1.88                     | 0.55              |
| 2:N:13:LYS:CG     | 2:N:14:PRO:HD2    | 2.30                     | 0.55              |
| 2:N:197:SER:HA    | 2:N:200:LEU:HD23  | 1.88                     | 0.55              |
| 5:J:7:SER:OG      | 5:J:21:THR:OG1    | 2.25                     | 0.55              |
| 5:M:7:SER:OG      | 5:M:21:THR:OG1    | 2.24                     | 0.55              |
| 4:D:172:THR:O     | 5:E:176:VAL:HG11  | 2.07                     | 0.54              |
| 1:B:1030:SER:HA   | 1:B:1034:LEU:HD12 | 1.89                     | 0.54              |
| 1:A:1105:THR:HG23 | 1:A:1111:GLU:H    | 1.72                     | 0.54              |
| 1:A:97:LYS:HB2    | 1:A:186:PHE:HA    | 1.88                     | 0.54              |
| 2:G:206:ILE:HD11  | 2:G:219:ASP:HB3   | 1.89                     | 0.54              |
| 1:A:32:PHE:HB3    | 1:A:218:GLN:HG3   | 1.89                     | 0.54              |
| 1:C:326:ILE:HD13  | 1:C:534:VAL:HG23  | 1.90                     | 0.54              |
| 1:C:951:VAL:O     | 1:C:955:ASN:ND2   | 2.40                     | 0.54              |
| 4:F:143:LEU:HB2   | 4:F:189:LEU:HB3   | 1.89                     | 0.54              |
| 1:C:326:ILE:HD12  | 1:C:328:ARG:HH22  | 1.73                     | 0.54              |
| 1:B:338:PHE:O     | 1:B:341:VAL:HG12  | 2.07                     | 0.54              |
| 1:B:457:ARG:NH1   | 1:B:469:SER:OG    | 2.39                     | 0.54              |
| 1:B:905:ARG:NH1   | 1:B:1049:LEU:O    | 2.41                     | 0.54              |
| 1:A:64:TRP:HE1    | 1:A:264:ALA:HB1   | 1.71                     | 0.54              |
| 1:A:889:GLY:HA3   | 1:A:1034:LEU:HD12 | 1.90                     | 0.54              |
| 1:A:951:VAL:O     | 1:A:955:ASN:ND2   | 2.40                     | 0.54              |
| 1:A:331:ASN:HB3   | 1:A:580:GLN:HA    | 1.91                     | 0.53              |
| 2:N:155:ASP:HA    | 2:N:186:LEU:HD21  | 1.91                     | 0.53              |
| 5:M:100:GLN:NE2   | 5:M:103:LEU:O     | 2.41                     | 0.53              |
| 4:D:162:ASP:H     | 4:D:165:PRO:HG2   | 1.73                     | 0.53              |
| 1:A:98:SER:HB3    | 1:A:181:GLY:HA2   | 1.90                     | 0.53              |
| 5:M:134:SER:H     | 5:M:137:SER:HB3   | 1.73                     | 0.53              |
| 1:C:922:LEU:HD11  | 6:P:1:NAG:H3      | 1.91                     | 0.53              |
| 1:A:617:CYS:N     | 1:A:649:CYS:SG    | 2.82                     | 0.53              |
| 1:B:32:PHE:HB3    | 1:B:218:GLN:HG3   | 1.90                     | 0.53              |
| 5:J:102:TRP:HE3   | 5:J:105:GLY:CA    | 2.22                     | 0.53              |
| 1:A:669:GLY:HA2   | 1:A:697:MET:HE3   | 1.91                     | 0.53              |
| 1:B:763:LEU:HD22  | 1:B:1008:VAL:HG21 | 1.91                     | 0.53              |
| 5:J:134:SER:H     | 5:J:137:SER:HB3   | 1.74                     | 0.53              |
| 1:C:913:GLN:NE2   | 1:B:1090:PRO:O    | 2.42                     | 0.53              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 5:E:39:ILE:HD11  | 5:E:107:PHE:CZ    | 2.44                     | 0.53              |
| 1:B:729:VAL:HG21 | 1:B:781:VAL:HG11  | 1.89                     | 0.53              |
| 1:A:128:ILE:HB   | 1:A:170:TYR:HB3   | 1.91                     | 0.53              |
| 3:O:183:LEU:HD23 | 3:O:185:LEU:HD11  | 1.90                     | 0.53              |
| 1:B:983:ARG:HG3  | 1:B:984:LEU:HG    | 1.89                     | 0.53              |
| 4:K:28:SER:OG    | 4:K:31:SER:OG     | 2.22                     | 0.53              |
| 4:K:35:GLN:HG2   | 5:M:106:ARG:CB    | 2.35                     | 0.53              |
| 1:B:1028:LYS:NZ  | 1:B:1042:PHE:O    | 2.40                     | 0.53              |
| 4:D:143:LEU:HD21 | 4:D:196:TRP:CZ3   | 2.44                     | 0.52              |
| 1:A:110:LEU:HD13 | 1:A:135:PHE:CB    | 2.39                     | 0.52              |
| 1:A:776:LYS:NZ   | 1:A:780:GLU:OE2   | 2.42                     | 0.52              |
| 1:B:574:ASP:HA   | 1:B:587:ILE:HB    | 1.90                     | 0.52              |
| 4:D:156:THR:OG1  | 4:D:207:THR:OG1   | 2.28                     | 0.52              |
| 4:D:170:VAL:CG2  | 4:D:189:LEU:HD13  | 2.39                     | 0.52              |
| 1:A:598:ILE:HB   | 1:A:609:ALA:HB3   | 1.92                     | 0.52              |
| 2:N:4:LEU:HD13   | 2:N:113:LEU:HD21  | 1.91                     | 0.52              |
| 1:C:408:ARG:NH2  | 4:D:72:ASN:OD1    | 2.42                     | 0.52              |
| 1:A:1041:ASP:HB3 | 1:B:1030:SER:HB3  | 1.92                     | 0.52              |
| 2:N:12:LYS:O     | 2:N:122:VAL:CG2   | 2.40                     | 0.52              |
| 1:C:87:ASN:HD21  | 1:C:269:TYR:HB3   | 1.74                     | 0.52              |
| 1:C:97:LYS:HB2   | 1:C:186:PHE:HA    | 1.92                     | 0.52              |
| 1:C:146:HIS:HB2  | 1:C:153:MET:HE1   | 1.92                     | 0.52              |
| 1:C:788:ILE:HD11 | 1:B:699:LEU:HB2   | 1.89                     | 0.52              |
| 3:I:197:SER:HB2  | 3:I:210:THR:HG22  | 1.91                     | 0.52              |
| 4:D:145:CYS:HB2  | 4:D:159:TRP:CZ2   | 2.44                     | 0.52              |
| 1:A:332:ILE:HG21 | 7:A:1306:NAG:H61  | 1.91                     | 0.52              |
| 1:B:567:ARG:NH1  | 1:B:571:ASP:OD1   | 2.42                     | 0.52              |
| 1:C:329:PHE:HZ   | 1:C:523:THR:HG23  | 1.75                     | 0.52              |
| 3:I:137:LEU:HB2  | 3:I:183:LEU:HB3   | 1.92                     | 0.52              |
| 1:B:689:SER:OG   | 1:B:690:GLN:N     | 2.42                     | 0.52              |
| 1:B:29:THR:HG23  | 1:B:62:VAL:HG13   | 1.92                     | 0.52              |
| 1:C:574:ASP:HA   | 1:C:587:ILE:HB    | 1.91                     | 0.51              |
| 3:I:120:VAL:HG23 | 3:I:141:ILE:HG12  | 1.91                     | 0.51              |
| 1:A:327:VAL:HG23 | 1:A:542:ASN:HD21  | 1.75                     | 0.51              |
| 1:A:361:CYS:SG   | 1:A:362:VAL:N     | 2.83                     | 0.51              |
| 2:H:134:PRO:HD3  | 2:H:220:LYS:HD3   | 1.91                     | 0.51              |
| 2:N:38:ARG:HE    | 2:N:92:ALA:HB3    | 1.73                     | 0.51              |
| 1:C:689:SER:OG   | 1:C:690:GLN:N     | 2.43                     | 0.51              |
| 1:A:774:GLN:HE22 | 1:A:1018:ILE:HG21 | 1.75                     | 0.51              |
| 3:L:120:VAL:HG12 | 3:L:141:ILE:HG23  | 1.92                     | 0.51              |
| 4:D:167:LYS:HE2  | 4:D:167:LYS:H     | 1.76                     | 0.51              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 2:G:54:ILE:HG23  | 2:G:55:LEU:HG    | 1.93                     | 0.51              |
| 2:G:143:SER:HG   | 1:A:462:LYS:HZ1  | 1.55                     | 0.51              |
| 5:E:175:ALA:HB2  | 5:E:185:LEU:HD23 | 1.92                     | 0.51              |
| 1:B:738:CYS:HB3  | 1:B:742:ILE:HD12 | 1.91                     | 0.51              |
| 4:F:60:PRO:HB2   | 4:F:62:ARG:HG2   | 1.93                     | 0.51              |
| 1:C:501:ASN:HB2  | 1:C:506:GLN:HE22 | 1.75                     | 0.51              |
| 4:D:160:LYS:HE2  | 4:D:203:SER:N    | 2.26                     | 0.51              |
| 1:B:332:ILE:HG13 | 1:B:334:ASN:OD1  | 2.11                     | 0.51              |
| 4:K:53:ASN:O     | 4:K:55:ARG:NH1   | 2.44                     | 0.51              |
| 2:N:180:VAL:HB   | 3:O:167:THR:HG22 | 1.92                     | 0.51              |
| 5:J:29:VAL:HA    | 5:J:36:TRP:HZ2   | 1.75                     | 0.51              |
| 3:I:7:PRO:HG2    | 3:I:20:ILE:HD11  | 1.92                     | 0.51              |
| 1:B:342:PHE:HB3  | 1:B:436:TRP:CH2  | 2.45                     | 0.51              |
| 1:B:861:LEU:HD12 | 1:B:862:PRO:HD2  | 1.93                     | 0.50              |
| 3:L:51:TYR:OH    | 3:L:55:ASN:ND2   | 2.43                     | 0.50              |
| 1:B:222:ALA:HB2  | 1:B:285:ILE:HB   | 1.94                     | 0.50              |
| 3:O:169:PRO:HB2  | 3:O:177:TYR:HD2  | 1.75                     | 0.50              |
| 4:D:50:TYR:HD2   | 4:D:51:GLU:HG3   | 1.77                     | 0.50              |
| 2:N:35:SER:HB2   | 2:N:47:TRP:HE1   | 1.76                     | 0.50              |
| 1:C:32:PHE:HB3   | 1:C:218:GLN:HG3  | 1.94                     | 0.50              |
| 1:C:905:ARG:NH1  | 1:C:1049:LEU:O   | 2.43                     | 0.50              |
| 3:L:113:GLN:HE21 | 3:L:146:PRO:HB3  | 1.77                     | 0.50              |
| 1:C:327:VAL:HG22 | 1:C:542:ASN:HB3  | 1.93                     | 0.50              |
| 5:J:108:ASP:OD1  | 5:J:108:ASP:N    | 2.43                     | 0.50              |
| 4:D:36:TRP:HB2   | 4:D:49:ILE:HG22  | 1.94                     | 0.50              |
| 4:D:162:ASP:C    | 4:D:165:PRO:HD2  | 2.37                     | 0.50              |
| 1:B:376:THR:HG22 | 4:F:31:SER:HB3   | 1.94                     | 0.50              |
| 2:H:197:SER:HA   | 2:H:200:LEU:HD23 | 1.93                     | 0.50              |
| 3:L:137:LEU:HD12 | 3:L:183:LEU:HD23 | 1.94                     | 0.50              |
| 4:D:160:LYS:HB2  | 4:D:203:SER:H    | 1.76                     | 0.50              |
| 1:A:1028:LYS:NZ  | 1:A:1042:PHE:O   | 2.44                     | 0.49              |
| 1:B:409:GLN:NE2  | 1:B:415:THR:O    | 2.45                     | 0.49              |
| 3:I:35:VAL:HG12  | 3:I:92:SER:HB2   | 1.93                     | 0.49              |
| 1:B:134:GLN:HB2  | 1:B:161:SER:HB2  | 1.94                     | 0.49              |
| 2:H:37:VAL:O     | 2:H:95:TYR:N     | 2.45                     | 0.49              |
| 1:C:201:PHE:HB3  | 1:C:229:LEU:HB2  | 1.94                     | 0.49              |
| 4:D:6:GLN:NE2    | 4:D:89:TYR:O     | 2.45                     | 0.49              |
| 1:A:574:ASP:HA   | 1:A:587:ILE:HB   | 1.94                     | 0.49              |
| 1:B:742:ILE:HG23 | 1:B:1000:ARG:HD3 | 1.94                     | 0.49              |
| 4:K:14:PRO:HA    | 4:K:81:LEU:HB2   | 1.94                     | 0.49              |
| 1:C:1028:LYS:NZ  | 1:C:1042:PHE:O   | 2.46                     | 0.49              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:384:PRO:HA   | 1:C:387:LEU:HD23 | 1.95                     | 0.49              |
| 1:A:346:ARG:NH2  | 2:H:60:TYR:O     | 2.45                     | 0.49              |
| 1:B:352:ALA:HA   | 1:B:466:ARG:HD3  | 1.95                     | 0.49              |
| 1:A:384:PRO:HA   | 1:A:387:LEU:HD23 | 1.94                     | 0.49              |
| 1:B:48:LEU:HB3   | 1:B:276:LEU:HD11 | 1.94                     | 0.49              |
| 1:B:821:LEU:HD11 | 1:B:939:SER:HB3  | 1.94                     | 0.49              |
| 4:K:50:TYR:HB2   | 5:M:106:ARG:CZ   | 2.43                     | 0.49              |
| 3:I:48:LEU:HD21  | 3:I:51:TYR:HD2   | 1.78                     | 0.49              |
| 1:A:102:ARG:HG3  | 1:A:141:LEU:HD12 | 1.95                     | 0.49              |
| 1:A:525:CYS:SG   | 1:A:526:GLY:N    | 2.86                     | 0.49              |
| 1:C:374:PHE:HD1  | 1:C:436:TRP:HB3  | 1.78                     | 0.49              |
| 1:A:919:ASN:HB2  | 1:A:922:LEU:HB3  | 1.94                     | 0.49              |
| 1:C:331:ASN:OD1  | 7:C:1306:NAG:C7  | 2.61                     | 0.49              |
| 1:A:403:ARG:NH2  | 1:A:406:GLU:OE2  | 2.46                     | 0.49              |
| 1:A:213:VAL:HG22 | 1:A:214:ARG:HD2  | 1.95                     | 0.48              |
| 1:A:720:ILE:HG13 | 1:A:923:ILE:HG13 | 1.94                     | 0.48              |
| 2:H:51:ILE:HG13  | 2:H:70:ILE:HB    | 1.95                     | 0.48              |
| 3:I:193:HIS:ND1  | 3:I:196:TYR:OH   | 2.44                     | 0.48              |
| 4:D:35:GLN:HB2   | 4:D:92:GLN:HB3   | 1.95                     | 0.48              |
| 5:E:99:ARG:HD3   | 5:E:109:TYR:CG   | 2.48                     | 0.48              |
| 1:A:143:VAL:HA   | 1:A:154:GLU:HA   | 1.95                     | 0.48              |
| 1:C:358:ILE:HB   | 1:C:395:VAL:HB   | 1.95                     | 0.48              |
| 1:B:278:LYS:HB3  | 1:B:287:ASP:H    | 1.78                     | 0.48              |
| 3:O:2:SER:OG     | 3:O:3:VAL:N      | 2.45                     | 0.48              |
| 1:B:374:PHE:HB2  | 5:J:104:ARG:NH2  | 2.27                     | 0.48              |
| 1:B:1029:MET:O   | 1:B:1033:VAL:HB  | 2.13                     | 0.48              |
| 5:M:40:ARG:HB3   | 5:M:50:ILE:HD11  | 1.96                     | 0.48              |
| 1:C:1041:ASP:HB3 | 1:A:1030:SER:HB3 | 1.96                     | 0.48              |
| 4:D:191:LEU:CD1  | 4:D:195:GLN:HB3  | 2.44                     | 0.48              |
| 1:A:92:PHE:O     | 1:A:192:PHE:N    | 2.43                     | 0.48              |
| 1:A:349:SER:OG   | 1:A:452:LEU:O    | 2.31                     | 0.48              |
| 4:F:127:THR:HG21 | 5:J:144:ALA:HB3  | 1.95                     | 0.48              |
| 1:A:78:ARG:HE    | 1:A:80:ASP:HB2   | 1.78                     | 0.48              |
| 1:A:689:SER:OG   | 1:A:690:GLN:N    | 2.44                     | 0.48              |
| 2:H:20:VAL:HG11  | 2:H:118:THR:HG21 | 1.95                     | 0.48              |
| 4:D:5:THR:HB     | 4:D:23:THR:HB    | 1.94                     | 0.48              |
| 1:A:435:ALA:HB2  | 1:A:510:VAL:HG23 | 1.96                     | 0.48              |
| 1:A:342:PHE:HE1  | 1:A:511:VAL:HG21 | 1.78                     | 0.48              |
| 1:B:346:ARG:NH2  | 3:O:98:SER:OG    | 2.45                     | 0.48              |
| 4:F:85:ASP:HB3   | 4:F:107:LEU:HD23 | 1.95                     | 0.48              |
| 1:C:406:GLU:OE2  | 1:C:417:LYS:NZ   | 2.46                     | 0.48              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 4:D:159:TRP:CZ3   | 4:D:204:CYS:HB2   | 2.49                     | 0.48              |
| 1:C:865:LEU:HD13  | 1:C:873:TYR:HE2   | 1.79                     | 0.47              |
| 1:C:1129:VAL:HG13 | 1:A:917:TYR:HB3   | 1.96                     | 0.47              |
| 5:E:53:ILE:HD12   | 5:E:71:ILE:HG23   | 1.97                     | 0.47              |
| 1:B:361:CYS:SG    | 1:B:362:VAL:N     | 2.87                     | 0.47              |
| 2:H:13:LYS:HZ3    | 2:H:16:SER:HG     | 1.56                     | 0.47              |
| 2:H:127:THR:HA    | 2:H:157:PHE:HB2   | 1.96                     | 0.47              |
| 1:C:1106:GLN:HE21 | 1:C:1109:PHE:HB3  | 1.77                     | 0.47              |
| 2:G:91:THR:HG22   | 2:G:122:VAL:H     | 1.79                     | 0.47              |
| 5:E:40:ARG:NH1    | 5:E:91:ASP:OD2    | 2.47                     | 0.47              |
| 5:M:16:GLU:HG2    | 5:M:17:THR:H      | 1.79                     | 0.47              |
| 1:A:355:ARG:HG2   | 3:L:31:ALA:HB1    | 1.96                     | 0.47              |
| 1:A:1129:VAL:HG13 | 1:B:917:TYR:HB3   | 1.95                     | 0.47              |
| 5:M:92:THR:HG22   | 5:M:118:VAL:H     | 1.79                     | 0.47              |
| 3:I:28:ASN:OD1    | 3:I:29:ILE:N      | 2.47                     | 0.47              |
| 1:A:197:ILE:H     | 1:A:202:LYS:HZ1   | 1.61                     | 0.47              |
| 3:O:84:ASP:HB3    | 3:O:108:LEU:HD23  | 1.97                     | 0.47              |
| 1:C:126:VAL:HB    | 1:C:172:SER:HB3   | 1.96                     | 0.47              |
| 5:E:4:LEU:HD11    | 5:E:99:ARG:HD2    | 1.97                     | 0.47              |
| 5:E:29:VAL:HA     | 5:E:36:TRP:HZ2    | 1.79                     | 0.47              |
| 1:A:565:PHE:HB2   | 1:B:42:VAL:HG12   | 1.96                     | 0.47              |
| 1:A:811:LYS:NZ    | 1:A:820:ASP:OD2   | 2.38                     | 0.47              |
| 1:A:948:LEU:HD21  | 1:A:1059:GLY:HA3  | 1.95                     | 0.47              |
| 1:B:367:VAL:HG13  | 1:B:368:LEU:HD12  | 1.97                     | 0.47              |
| 1:B:730:SER:HA    | 1:B:774:GLN:OE1   | 2.15                     | 0.47              |
| 1:B:767:LEU:HA    | 1:B:770:ILE:HG22  | 1.96                     | 0.47              |
| 1:B:878:LEU:HD11  | 1:B:1054:GLN:HE22 | 1.80                     | 0.47              |
| 4:F:81:LEU:HD21   | 4:F:109:VAL:HG12  | 1.95                     | 0.47              |
| 1:B:142:GLY:HA3   | 1:B:156:GLU:HB2   | 1.96                     | 0.47              |
| 1:B:369:TYR:OH    | 5:J:103:LEU:HB3   | 2.15                     | 0.47              |
| 5:J:204:ASN:ND2   | 5:J:215:ASP:OD1   | 2.40                     | 0.47              |
| 1:C:78:ARG:NH2    | 1:C:80:ASP:OD2    | 2.42                     | 0.47              |
| 5:M:74:ASP:OD1    | 5:M:74:ASP:N      | 2.46                     | 0.47              |
| 2:G:12:LYS:HG3    | 2:G:18:VAL:HG12   | 1.97                     | 0.47              |
| 1:B:34:ARG:NH1    | 1:B:191:GLU:OE2   | 2.47                     | 0.47              |
| 5:J:5:GLN:OE1     | 5:J:23:THR:OG1    | 2.33                     | 0.47              |
| 4:K:147:ILE:HD13  | 4:K:155:VAL:HG11  | 1.96                     | 0.47              |
| 3:O:49:LEU:O      | 3:O:56:ARG:NH1    | 2.48                     | 0.46              |
| 1:C:92:PHE:O      | 1:C:192:PHE:N     | 2.42                     | 0.46              |
| 1:C:468:ILE:HG12  | 2:G:107:ALA:HB1   | 1.96                     | 0.46              |
| 2:G:182:GLN:HB2   | 2:G:186:LEU:H     | 1.79                     | 0.46              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 5:E:102:TRP:HB3  | 5:E:105:GLY:CA    | 2.37                     | 0.46              |
| 1:A:399:SER:HA   | 1:A:511:VAL:HG12  | 1.97                     | 0.46              |
| 1:B:906:PHE:HE1  | 1:B:1049:LEU:HD21 | 1.80                     | 0.46              |
| 1:B:908:GLY:O    | 1:B:1038:LYS:NZ   | 2.42                     | 0.46              |
| 1:A:699:LEU:HD11 | 1:B:869:MET:HG3   | 1.98                     | 0.46              |
| 1:A:767:LEU:HA   | 1:A:770:ILE:HG22  | 1.97                     | 0.46              |
| 5:J:42:PRO:HA    | 5:J:93:ALA:HA     | 1.98                     | 0.46              |
| 1:C:669:GLY:HA2  | 1:C:697:MET:HE3   | 1.98                     | 0.46              |
| 3:I:6:GLN:HB2    | 3:I:104:GLY:N     | 2.29                     | 0.46              |
| 4:K:35:GLN:CG    | 5:M:106:ARG:HB3   | 2.38                     | 0.46              |
| 1:A:378:LYS:HD3  | 1:A:380:TYR:CD2   | 2.50                     | 0.46              |
| 2:N:112:ASP:OD1  | 2:N:112:ASP:N     | 2.48                     | 0.46              |
| 4:K:6:GLN:NE2    | 4:K:89:TYR:O      | 2.48                     | 0.46              |
| 1:A:245:HIS:HB2  | 1:A:259:THR:HG23  | 1.98                     | 0.46              |
| 1:B:80:ASP:N     | 1:B:80:ASP:OD1    | 2.49                     | 0.46              |
| 1:C:403:ARG:NH2  | 1:C:406:GLU:OE2   | 2.49                     | 0.46              |
| 4:D:194:GLU:CD   | 4:D:194:GLU:H     | 2.23                     | 0.46              |
| 1:C:355:ARG:HD2  | 3:I:31:ALA:HB1    | 1.98                     | 0.46              |
| 1:A:142:GLY:HA3  | 1:A:156:GLU:HB2   | 1.97                     | 0.46              |
| 1:C:393:THR:HA   | 1:C:522:ALA:HA    | 1.97                     | 0.46              |
| 1:C:936:ASP:O    | 1:C:939:SER:OG    | 2.31                     | 0.46              |
| 1:A:323:THR:OG1  | 1:A:324:GLU:OE1   | 2.30                     | 0.46              |
| 1:A:480:CYS:HB3  | 1:A:483:VAL:HG12  | 1.97                     | 0.46              |
| 1:B:1050:MET:HE2 | 1:B:1050:MET:HB3  | 1.57                     | 0.46              |
| 3:O:63:ARG:HH22  | 3:O:77:ILE:HD12   | 1.81                     | 0.46              |
| 1:A:1097:SER:HB3 | 1:A:1102:TRP:CD2  | 2.51                     | 0.45              |
| 3:O:50:ILE:HB    | 3:O:56:ARG:HH12   | 1.81                     | 0.45              |
| 1:C:172:SER:OG   | 1:C:173:GLN:N     | 2.50                     | 0.45              |
| 1:A:197:ILE:HG22 | 1:A:202:LYS:HZ1   | 1.82                     | 0.45              |
| 3:L:185:LEU:HB3  | 3:L:189:GLN:HE22  | 1.81                     | 0.45              |
| 1:C:565:PHE:HB2  | 1:A:42:VAL:HG12   | 1.98                     | 0.45              |
| 1:C:656:VAL:HG22 | 1:C:658:ASN:H     | 1.82                     | 0.45              |
| 2:G:20:VAL:HB    | 2:G:81:MET:HB3    | 1.98                     | 0.45              |
| 1:B:92:PHE:O     | 1:B:192:PHE:N     | 2.40                     | 0.45              |
| 1:B:962:LEU:HD21 | 1:B:1007:TYR:HB2  | 1.98                     | 0.45              |
| 3:O:111:LEU:HG   | 3:O:112:GLY:H     | 1.82                     | 0.45              |
| 1:C:331:ASN:OD1  | 7:C:1306:NAG:H83  | 2.16                     | 0.45              |
| 1:A:48:LEU:HB3   | 1:A:276:LEU:HD11  | 1.97                     | 0.45              |
| 1:B:1103:PHE:HZ  | 6:Z:1:NAG:H62     | 1.81                     | 0.45              |
| 3:L:130:LEU:HD22 | 3:L:191:LYS:HZ1   | 1.80                     | 0.45              |
| 3:L:147:GLY:HA3  | 3:L:169:PRO:HG2   | 1.99                     | 0.45              |

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| Atom-1            | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|------------------|--------------------------|-------------------|
| 1:C:825:LYS:NZ    | 1:C:938:LEU:O    | 2.50                     | 0.45              |
| 1:A:200:TYR:O     | 1:A:202:LYS:NZ   | 2.34                     | 0.45              |
| 2:G:12:LYS:HD3    | 2:G:12:LYS:HA    | 1.86                     | 0.45              |
| 4:D:160:LYS:HE2   | 4:D:160:LYS:HB2  | 1.42                     | 0.45              |
| 1:A:376:THR:OG1   | 4:K:31:SER:O     | 2.33                     | 0.45              |
| 1:B:384:PRO:HA    | 1:B:387:LEU:HD23 | 1.99                     | 0.45              |
| 1:B:1045:LYS:HE2  | 1:B:1045:LYS:HB2 | 1.81                     | 0.45              |
| 2:H:52:ILE:HD12   | 2:H:53:PRO:HD2   | 1.97                     | 0.45              |
| 1:C:886:TRP:HB3   | 1:C:1035:GLY:HA2 | 1.99                     | 0.45              |
| 1:C:894:LEU:HB3   | 1:B:713:ALA:HB3  | 1.98                     | 0.45              |
| 1:A:596:SER:N     | 1:A:611:LEU:O    | 2.49                     | 0.45              |
| 1:B:457:ARG:HD2   | 1:B:457:ARG:HA   | 1.77                     | 0.45              |
| 1:B:993:ILE:O     | 1:B:997:ILE:HG12 | 2.16                     | 0.45              |
| 1:B:728:PRO:HD3   | 1:B:947:LYS:HB3  | 1.99                     | 0.45              |
| 2:N:67:ARG:HH12   | 2:N:83:LEU:HD11  | 1.82                     | 0.45              |
| 4:D:160:LYS:HG2   | 4:D:202:TYR:CD2  | 2.52                     | 0.44              |
| 1:A:1116:THR:HG22 | 1:A:1138:TYR:HB3 | 1.99                     | 0.44              |
| 2:H:30:SER:HB2    | 2:H:74:LYS:HE2   | 1.99                     | 0.44              |
| 4:K:145:CYS:O     | 4:K:187:SER:N    | 2.51                     | 0.44              |
| 4:K:147:ILE:O     | 4:K:185:ALA:N    | 2.44                     | 0.44              |
| 1:C:457:ARG:HD2   | 1:C:457:ARG:HA   | 1.76                     | 0.44              |
| 1:C:535:LYS:HB3   | 1:C:552:LEU:O    | 2.17                     | 0.44              |
| 4:D:40:ARG:NH2    | 4:D:84:GLU:O     | 2.50                     | 0.44              |
| 5:E:13:LYS:HB2    | 5:E:16:GLU:HG3   | 1.99                     | 0.44              |
| 1:A:342:PHE:CE1   | 1:A:511:VAL:HG21 | 2.52                     | 0.44              |
| 1:B:403:ARG:HG2   | 1:B:497:PHE:HE1  | 1.82                     | 0.44              |
| 1:C:1103:PHE:HZ   | 6:R:1:NAG:H62    | 1.82                     | 0.44              |
| 1:A:961:THR:O     | 1:A:965:GLN:HG2  | 2.17                     | 0.44              |
| 3:O:113:GLN:HB3   | 3:O:146:PRO:HB3  | 1.99                     | 0.44              |
| 5:J:107:PHE:HB2   | 5:J:110:TRP:NE1  | 2.32                     | 0.44              |
| 1:A:457:ARG:HD2   | 1:A:457:ARG:HA   | 1.73                     | 0.44              |
| 1:B:880:GLY:O     | 1:B:884:SER:OG   | 2.28                     | 0.44              |
| 5:J:98:ALA:HB1    | 5:J:107:PHE:HB3  | 2.00                     | 0.44              |
| 5:J:100:GLN:NE2   | 5:J:103:LEU:O    | 2.50                     | 0.44              |
| 5:M:53:ILE:HD12   | 5:M:71:ILE:HG23  | 1.99                     | 0.44              |
| 1:C:538:CYS:HB2   | 1:C:590:CYS:HB3  | 1.81                     | 0.44              |
| 2:G:166:ASN:HB2   | 2:G:169:ALA:HB3  | 2.00                     | 0.44              |
| 2:H:132:VAL:HG21  | 2:H:209:VAL:HG21 | 1.98                     | 0.44              |
| 4:K:121:LYS:HD2   | 4:K:152:PRO:HD3  | 2.00                     | 0.44              |
| 1:B:663:ASP:OD1   | 1:B:663:ASP:N    | 2.44                     | 0.44              |
| 5:M:106:ARG:H     | 5:M:106:ARG:NE   | 2.14                     | 0.44              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:C:21:ARG:HH21  | 1:C:79:PHE:HB3    | 1.83                     | 0.44              |
| 1:C:106:PHE:HB3  | 1:C:235:ILE:HG21  | 1.99                     | 0.44              |
| 4:D:145:CYS:O    | 4:D:187:SER:N     | 2.50                     | 0.44              |
| 1:B:617:CYS:N    | 1:B:649:CYS:SG    | 2.91                     | 0.44              |
| 4:F:35:GLN:HG2   | 5:J:106:ARG:CB    | 2.47                     | 0.44              |
| 5:J:53:ILE:HD12  | 5:J:71:ILE:HG23   | 1.99                     | 0.44              |
| 5:E:40:ARG:HB3   | 5:E:50:ILE:HD11   | 2.00                     | 0.44              |
| 2:H:67:ARG:HH12  | 2:H:87:ARG:NH1    | 2.16                     | 0.44              |
| 3:L:35:VAL:HG22  | 3:L:68:LYS:HD3    | 1.99                     | 0.44              |
| 4:K:124:PRO:HG3  | 4:K:208:HIS:HB3   | 2.00                     | 0.44              |
| 1:C:805:ILE:HG22 | 1:C:878:LEU:HD13  | 2.00                     | 0.44              |
| 4:D:164:SER:N    | 4:D:165:PRO:HD2   | 2.33                     | 0.44              |
| 1:A:369:TYR:OH   | 5:M:104:ARG:HG2   | 2.18                     | 0.44              |
| 5:J:5:GLN:NE2    | 5:J:6:GLU:O       | 2.47                     | 0.43              |
| 4:K:18:VAL:HG12  | 4:K:81:LEU:HD21   | 1.99                     | 0.43              |
| 3:I:6:GLN:CB     | 3:I:105:GLY:H     | 2.32                     | 0.43              |
| 1:B:138:ASP:OD1  | 1:B:138:ASP:N     | 2.51                     | 0.43              |
| 1:B:214:ARG:HH11 | 1:B:215:ASP:H     | 1.66                     | 0.43              |
| 1:B:911:VAL:HG22 | 1:B:1108:ASN:HB2  | 2.00                     | 0.43              |
| 5:J:36:TRP:HB2   | 5:J:53:ILE:HG22   | 2.00                     | 0.43              |
| 1:C:1090:PRO:HG2 | 1:A:913:GLN:HE22  | 1.83                     | 0.43              |
| 4:D:13:SER:HA    | 4:D:109:VAL:HG23  | 2.00                     | 0.43              |
| 1:B:344:ALA:O    | 1:B:345:THR:C     | 2.62                     | 0.43              |
| 1:B:472:ILE:HD12 | 1:B:482:GLY:HA2   | 2.01                     | 0.43              |
| 2:N:211:HIS:CD2  | 2:N:213:PRO:HD2   | 2.53                     | 0.43              |
| 3:O:40:GLN:HG3   | 3:O:46:PRO:HG3    | 2.01                     | 0.43              |
| 4:F:36:TRP:HB2   | 4:F:49:ILE:HG22   | 2.00                     | 0.43              |
| 5:E:28:SER:HB3   | 5:E:31:SER:HB2    | 1.99                     | 0.43              |
| 1:A:714:ILE:HD12 | 1:A:1096:VAL:HG11 | 2.01                     | 0.43              |
| 1:B:642:VAL:HG22 | 1:B:651:ILE:HG22  | 2.00                     | 0.43              |
| 3:L:34:ASP:OD1   | 3:L:68:LYS:NZ     | 2.51                     | 0.43              |
| 3:L:63:ARG:NH2   | 3:L:81:GLN:HE22   | 2.16                     | 0.43              |
| 3:I:113:GLN:HE21 | 3:I:146:PRO:HB3   | 1.83                     | 0.43              |
| 1:A:751:ASN:HA   | 1:A:754:LEU:HD13  | 2.00                     | 0.43              |
| 1:A:909:ILE:HG13 | 1:A:911:VAL:HG23  | 1.99                     | 0.43              |
| 1:B:459:SER:OG   | 1:B:460:ASN:N     | 2.49                     | 0.43              |
| 1:C:892:PRO:HD2  | 1:B:1069:PRO:HG2  | 2.00                     | 0.43              |
| 1:A:563:GLN:NE2  | 1:B:42:VAL:O      | 2.52                     | 0.43              |
| 1:A:976:VAL:HG22 | 1:A:978:ASN:H     | 1.83                     | 0.43              |
| 3:L:63:ARG:NH1   | 3:L:77:ILE:HB     | 2.33                     | 0.43              |
| 1:C:540:ASN:HB2  | 1:C:549:THR:HG22  | 2.00                     | 0.43              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:C:933:LYS:HD3  | 1:C:933:LYS:HA    | 1.92                     | 0.43              |
| 1:A:751:ASN:OD1  | 1:A:752:LEU:N     | 2.51                     | 0.43              |
| 4:K:11:SER:HB2   | 4:K:110:LEU:HD21  | 2.01                     | 0.43              |
| 1:C:808:ASP:OD1  | 1:C:808:ASP:N     | 2.51                     | 0.43              |
| 1:C:913:GLN:HE22 | 1:B:1090:PRO:HG2  | 1.83                     | 0.43              |
| 1:A:320:VAL:H    | 1:A:591:SER:HB2   | 1.83                     | 0.43              |
| 1:B:726:ILE:HB   | 1:B:947:LYS:HE2   | 2.00                     | 0.43              |
| 5:M:63:PRO:HA    | 5:M:66:LYS:HG2    | 2.01                     | 0.43              |
| 5:M:106:ARG:HB3  | 5:M:106:ARG:HE    | 1.50                     | 0.43              |
| 1:B:1086:LYS:HD2 | 1:B:1122:VAL:HG11 | 2.01                     | 0.43              |
| 3:O:171:LYS:NZ   | 3:O:177:TYR:OH    | 2.45                     | 0.43              |
| 5:J:20:LEU:HD12  | 5:J:95:TYR:HD2    | 1.84                     | 0.43              |
| 1:A:886:TRP:HB3  | 1:A:1035:GLY:HA2  | 2.00                     | 0.43              |
| 1:C:34:ARG:NH1   | 1:C:191:GLU:OE2   | 2.52                     | 0.42              |
| 1:A:880:GLY:O    | 1:A:884:SER:OG    | 2.29                     | 0.42              |
| 1:A:110:LEU:HD23 | 1:A:237:ARG:NH2   | 2.34                     | 0.42              |
| 1:A:995:ARG:HA   | 1:A:998:THR:HG22  | 2.00                     | 0.42              |
| 2:H:98:ARG:HB3   | 2:H:113:LEU:HB3   | 2.02                     | 0.42              |
| 2:G:38:ARG:HE    | 2:G:92:ALA:HB3    | 1.84                     | 0.42              |
| 4:D:45:PRO:HD2   | 5:E:110:TRP:CE3   | 2.55                     | 0.42              |
| 5:E:3:GLN:HE21   | 5:E:25:SER:HB2    | 1.84                     | 0.42              |
| 1:A:719:THR:HG23 | 1:A:1070:ALA:HB2  | 2.01                     | 0.42              |
| 4:K:60:PRO:HD2   | 4:K:63:PHE:HE2    | 1.84                     | 0.42              |
| 1:C:138:ASP:N    | 1:C:138:ASP:OD1   | 2.51                     | 0.42              |
| 1:B:224:GLU:N    | 1:B:224:GLU:OE1   | 2.53                     | 0.42              |
| 1:B:330:PRO:O    | 1:B:580:GLN:NE2   | 2.48                     | 0.42              |
| 3:O:6:GLN:HE21   | 3:O:106:THR:HG23  | 1.84                     | 0.42              |
| 3:O:20:ILE:HD12  | 3:O:20:ILE:HA     | 1.90                     | 0.42              |
| 1:C:453:TYR:HB3  | 1:C:495:TYR:HE1   | 1.84                     | 0.42              |
| 1:C:904:TYR:CE1  | 1:B:1107:ARG:HD3  | 2.55                     | 0.42              |
| 1:A:886:TRP:HH2  | 1:A:904:TYR:HB3   | 1.83                     | 0.42              |
| 3:O:14:PRO:HA    | 3:O:80:LEU:HB2    | 2.01                     | 0.42              |
| 3:O:120:VAL:HG12 | 3:O:141:ILE:HG23  | 2.01                     | 0.42              |
| 1:C:170:TYR:CE2  | 1:C:227:VAL:HG21  | 2.54                     | 0.42              |
| 2:G:180:VAL:HB   | 3:I:167:THR:HG22  | 2.01                     | 0.42              |
| 3:I:56:ARG:NH1   | 3:I:64:PHE:O      | 2.53                     | 0.42              |
| 4:D:14:PRO:HA    | 4:D:81:LEU:HB2    | 2.00                     | 0.42              |
| 2:G:127:THR:HA   | 2:G:157:PHE:HB3   | 2.02                     | 0.42              |
| 3:I:144:PHE:HE2  | 3:I:147:GLY:HA2   | 1.84                     | 0.42              |
| 1:A:821:LEU:HD11 | 1:A:939:SER:HB3   | 2.01                     | 0.42              |
| 1:B:340:GLU:H    | 1:B:340:GLU:HG3   | 1.42                     | 0.42              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 1:B:886:TRP:HB3  | 1:B:1035:GLY:HA2  | 2.00                     | 0.42              |
| 3:O:168:THR:HA   | 3:O:169:PRO:HD3   | 1.92                     | 0.42              |
| 1:C:1006:THR:O   | 1:C:1010:GLN:HG2  | 2.20                     | 0.42              |
| 3:I:27:SER:OG    | 3:I:95:SER:OG     | 2.37                     | 0.42              |
| 1:A:962:LEU:HD11 | 1:A:1007:TYR:CD2  | 2.55                     | 0.42              |
| 1:B:102:ARG:HG3  | 1:B:141:LEU:HD13  | 2.02                     | 0.42              |
| 5:M:36:TRP:HB2   | 5:M:53:ILE:HG22   | 2.00                     | 0.42              |
| 1:C:88:ASP:OD1   | 1:C:88:ASP:N      | 2.52                     | 0.42              |
| 5:E:36:TRP:HB2   | 5:E:53:ILE:HG22   | 2.01                     | 0.42              |
| 2:H:63:LYS:HD3   | 3:L:97:LEU:HD11   | 2.01                     | 0.42              |
| 3:L:17:ARG:HE    | 3:L:76:ALA:HB1    | 1.85                     | 0.42              |
| 3:O:6:GLN:HB2    | 3:O:105:GLY:H     | 1.85                     | 0.42              |
| 4:F:53:ASN:O     | 4:F:55:ARG:NH1    | 2.52                     | 0.42              |
| 1:C:990:GLU:HA   | 1:C:993:ILE:HG22  | 2.02                     | 0.42              |
| 2:G:13:LYS:HE3   | 2:G:14:PRO:HD2    | 2.02                     | 0.42              |
| 1:A:736:VAL:HG11 | 1:A:1004:LEU:HD11 | 2.02                     | 0.42              |
| 3:L:81:GLN:NE2   | 3:L:83:GLU:OE2    | 2.53                     | 0.42              |
| 3:O:144:PHE:HE2  | 3:O:147:GLY:HA2   | 1.85                     | 0.42              |
| 5:M:11:LEU:HD21  | 5:M:154:PRO:HG3   | 2.02                     | 0.42              |
| 1:C:80:ASP:OD1   | 1:C:80:ASP:N      | 2.53                     | 0.41              |
| 2:H:199:SER:OG   | 2:H:205:TYR:OH    | 2.37                     | 0.41              |
| 4:F:95:ASP:HB3   | 4:F:96:SER:H      | 1.61                     | 0.41              |
| 5:M:53:ILE:HD13  | 5:M:73:VAL:HG23   | 2.01                     | 0.41              |
| 1:C:328:ARG:HA   | 1:C:328:ARG:HD3   | 1.36                     | 0.41              |
| 1:C:642:VAL:HG13 | 1:C:651:ILE:HG22  | 2.02                     | 0.41              |
| 1:C:899:PRO:HB3  | 1:C:920:GLN:NE2   | 2.35                     | 0.41              |
| 1:A:328:ARG:HB2  | 1:A:530:SER:HA    | 2.02                     | 0.41              |
| 1:A:866:THR:H    | 1:A:869:MET:HE2   | 1.84                     | 0.41              |
| 1:B:214:ARG:NH1  | 1:B:215:ASP:H     | 2.19                     | 0.41              |
| 2:N:134:PRO:HB2  | 2:N:222:VAL:HG23  | 2.03                     | 0.41              |
| 1:C:535:LYS:C    | 1:C:537:LYS:N     | 2.77                     | 0.41              |
| 1:A:128:ILE:HG21 | 1:A:229:LEU:HD13  | 2.01                     | 0.41              |
| 1:A:472:ILE:HD12 | 1:A:482:GLY:HA2   | 2.02                     | 0.41              |
| 1:A:538:CYS:HB2  | 1:A:590:CYS:HB3   | 1.68                     | 0.41              |
| 3:O:169:PRO:HB2  | 3:O:177:TYR:CD2   | 2.54                     | 0.41              |
| 1:C:42:VAL:O     | 1:B:563:GLN:NE2   | 2.53                     | 0.41              |
| 4:D:50:TYR:HB2   | 5:E:106:ARG:NE    | 2.34                     | 0.41              |
| 4:D:165:PRO:HB3  | 4:D:202:TYR:CZ    | 2.56                     | 0.41              |
| 1:A:117:LEU:HG   | 1:A:130:VAL:HG22  | 2.02                     | 0.41              |
| 1:B:1010:GLN:O   | 1:B:1014:ARG:HG2  | 2.20                     | 0.41              |
| 2:H:90:ASP:HB2   | 2:H:122:VAL:HG12  | 2.03                     | 0.41              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 3:O:41:LEU:HB3   | 3:O:44:THR:HG22  | 2.01                     | 0.41              |
| 5:M:120:SER:OG   | 5:M:121:ALA:N    | 2.52                     | 0.41              |
| 2:G:15:GLY:HA2   | 2:G:85:SER:HA    | 2.02                     | 0.41              |
| 1:A:21:ARG:HH21  | 1:A:79:PHE:HB3   | 1.85                     | 0.41              |
| 1:A:203:ILE:HD11 | 1:A:227:VAL:HG12 | 2.03                     | 0.41              |
| 1:A:409:GLN:O    | 1:A:414:GLN:NE2  | 2.53                     | 0.41              |
| 1:B:742:ILE:HG12 | 1:B:1000:ARG:HB3 | 2.02                     | 0.41              |
| 1:C:435:ALA:HB2  | 1:C:510:VAL:HG22 | 2.02                     | 0.41              |
| 1:C:699:LEU:HD21 | 1:A:869:MET:HG3  | 2.01                     | 0.41              |
| 1:C:727:LEU:HD11 | 1:C:1028:LYS:HD2 | 2.02                     | 0.41              |
| 1:A:159:VAL:HG23 | 1:A:160:TYR:CD1  | 2.56                     | 0.41              |
| 1:B:339:GLY:O    | 1:B:343:ASN:N    | 2.54                     | 0.41              |
| 3:L:187:PRO:HA   | 3:L:190:TRP:HB3  | 2.03                     | 0.41              |
| 1:C:1097:SER:HB3 | 1:C:1102:TRP:CD2 | 2.55                     | 0.41              |
| 4:D:17:THR:HA    | 4:D:79:SER:HA    | 2.01                     | 0.41              |
| 1:A:726:ILE:HB   | 1:A:947:LYS:HE2  | 2.03                     | 0.41              |
| 1:B:355:ARG:HG2  | 3:O:31:ALA:HB1   | 2.02                     | 0.41              |
| 1:B:468:ILE:HG12 | 2:N:107:ALA:HB1  | 2.02                     | 0.41              |
| 1:B:669:GLY:HA2  | 1:B:697:MET:HE3  | 2.02                     | 0.41              |
| 2:H:180:VAL:HB   | 3:L:167:THR:HG22 | 2.01                     | 0.41              |
| 3:I:40:GLN:HB2   | 3:I:87:ASP:HB2   | 2.03                     | 0.41              |
| 1:A:239:GLN:NE2  | 1:A:240:THR:O    | 2.54                     | 0.41              |
| 1:A:358:ILE:HG22 | 1:A:524:VAL:HG21 | 2.02                     | 0.41              |
| 1:B:21:ARG:HH21  | 1:B:79:PHE:HB3   | 1.85                     | 0.41              |
| 1:B:37:TYR:OH    | 1:B:53:ASP:OD2   | 2.39                     | 0.41              |
| 2:H:166:ASN:HB2  | 2:H:169:ALA:HB3  | 2.02                     | 0.41              |
| 4:F:22:CYS:N     | 4:F:74:ALA:O     | 2.53                     | 0.41              |
| 5:M:138:THR:OG1  | 5:M:142:THR:O    | 2.35                     | 0.41              |
| 1:C:79:PHE:HB2   | 1:C:258:TRP:CH2  | 2.56                     | 0.41              |
| 4:D:35:GLN:CG    | 5:E:106:ARG:HE   | 2.34                     | 0.41              |
| 1:A:191:GLU:HB2  | 1:A:223:LEU:HD11 | 2.03                     | 0.41              |
| 1:B:879:ALA:O    | 1:B:883:THR:OG1  | 2.34                     | 0.41              |
| 2:N:12:LYS:HA    | 2:N:12:LYS:HD3   | 1.94                     | 0.41              |
| 1:C:131:CYS:HA   | 1:C:166:CYS:HB3  | 2.03                     | 0.40              |
| 1:C:535:LYS:O    | 1:C:537:LYS:N    | 2.54                     | 0.40              |
| 1:C:617:CYS:N    | 1:C:649:CYS:SG   | 2.95                     | 0.40              |
| 1:C:873:TYR:HE1  | 1:B:699:LEU:HB3  | 1.86                     | 0.40              |
| 5:E:13:LYS:HD2   | 5:E:119:SER:OG   | 2.20                     | 0.40              |
| 1:B:109:THR:OG1  | 1:B:111:ASP:OD1  | 2.31                     | 0.40              |
| 1:B:954:GLN:OE1  | 1:B:1014:ARG:NH1 | 2.52                     | 0.40              |
| 1:C:666:ILE:HB   | 1:C:670:ILE:O    | 2.21                     | 0.40              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:C:869:MET:HE2  | 1:C:869:MET:HB3  | 1.97                     | 0.40              |
| 1:C:1125:ASN:OD1 | 1:C:1126:CYS:N   | 2.54                     | 0.40              |
| 1:A:216:LEU:HA   | 1:A:217:PRO:HD3  | 1.96                     | 0.40              |
| 4:D:22:CYS:N     | 4:D:74:ALA:O     | 2.54                     | 0.40              |
| 4:D:94:TYR:HE1   | 5:E:103:LEU:HG   | 1.86                     | 0.40              |
| 5:E:106:ARG:HD2  | 5:E:106:ARG:N    | 2.36                     | 0.40              |
| 1:B:37:TYR:HB3   | 1:B:223:LEU:HB2  | 2.03                     | 0.40              |
| 1:B:96:GLU:OE2   | 1:B:100:ILE:N    | 2.52                     | 0.40              |
| 1:B:906:PHE:CE2  | 1:B:916:LEU:HD12 | 2.57                     | 0.40              |
| 3:O:165:GLU:OE2  | 3:O:182:TYR:N    | 2.54                     | 0.40              |
| 3:I:6:GLN:OE1    | 3:I:89:TYR:HA    | 2.21                     | 0.40              |
| 1:A:1082:CYS:HB2 | 1:A:1126:CYS:HB2 | 1.96                     | 0.40              |
| 5:E:216:LYS:HB2  | 5:E:216:LYS:HE2  | 1.89                     | 0.40              |
| 1:B:516:GLU:HG2  | 1:B:518:LEU:HD22 | 2.04                     | 0.40              |
| 4:F:124:PRO:HG3  | 4:F:208:HIS:ND1  | 2.36                     | 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     | 1054/1278 (82%) | 1017 (96%) | 37 (4%) | 0        | 100         | 100 |
| 1   | B     | 1054/1278 (82%) | 1025 (97%) | 29 (3%) | 0        | 100         | 100 |
| 1   | C     | 1054/1278 (82%) | 1015 (96%) | 39 (4%) | 0        | 100         | 100 |
| 2   | G     | 225/228 (99%)   | 213 (95%)  | 12 (5%) | 0        | 100         | 100 |
| 2   | H     | 225/228 (99%)   | 214 (95%)  | 11 (5%) | 0        | 100         | 100 |
| 2   | N     | 225/228 (99%)   | 214 (95%)  | 11 (5%) | 0        | 100         | 100 |
| 3   | I     | 211/214 (99%)   | 203 (96%)  | 8 (4%)  | 0        | 100         | 100 |
| 3   | L     | 211/214 (99%)   | 198 (94%)  | 13 (6%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|----------|----------|-------------|-----|
| 3   | O     | 211/214 (99%)   | 199 (94%)  | 12 (6%)  | 0        | 100         | 100 |
| 4   | D     | 209/243 (86%)   | 198 (95%)  | 11 (5%)  | 0        | 100         | 100 |
| 4   | F     | 209/243 (86%)   | 197 (94%)  | 12 (6%)  | 0        | 100         | 100 |
| 4   | K     | 209/243 (86%)   | 194 (93%)  | 15 (7%)  | 0        | 100         | 100 |
| 5   | E     | 222/243 (91%)   | 215 (97%)  | 7 (3%)   | 0        | 100         | 100 |
| 5   | J     | 222/243 (91%)   | 217 (98%)  | 5 (2%)   | 0        | 100         | 100 |
| 5   | M     | 222/243 (91%)   | 215 (97%)  | 7 (3%)   | 0        | 100         | 100 |
| All | All   | 5763/6618 (87%) | 5534 (96%) | 229 (4%) | 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     | 934/1106 (84%) | 933 (100%) | 1 (0%)   | 92          | 95  |
| 1   | B     | 934/1106 (84%) | 930 (100%) | 4 (0%)   | 89          | 91  |
| 1   | C     | 934/1106 (84%) | 924 (99%)  | 10 (1%)  | 70          | 80  |
| 2   | G     | 184/186 (99%)  | 183 (100%) | 1 (0%)   | 86          | 90  |
| 2   | H     | 184/186 (99%)  | 184 (100%) | 0        | 100         | 100 |
| 2   | N     | 184/186 (99%)  | 183 (100%) | 1 (0%)   | 86          | 90  |
| 3   | I     | 174/177 (98%)  | 173 (99%)  | 1 (1%)   | 84          | 88  |
| 3   | L     | 174/177 (98%)  | 174 (100%) | 0        | 100         | 100 |
| 3   | O     | 174/177 (98%)  | 174 (100%) | 0        | 100         | 100 |
| 4   | D     | 184/208 (88%)  | 175 (95%)  | 9 (5%)   | 21          | 44  |
| 4   | F     | 184/208 (88%)  | 184 (100%) | 0        | 100         | 100 |
| 4   | K     | 184/208 (88%)  | 184 (100%) | 0        | 100         | 100 |
| 5   | E     | 192/209 (92%)  | 189 (98%)  | 3 (2%)   | 58          | 74  |
| 5   | J     | 192/209 (92%)  | 190 (99%)  | 2 (1%)   | 73          | 81  |

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| Mol | Chain | Analysed        | Rotameric  | Outliers | Percentiles |    |
|-----|-------|-----------------|------------|----------|-------------|----|
| 5   | M     | 192/209 (92%)   | 191 (100%) | 1 (0%)   | 86          | 90 |
| All | All   | 5004/5658 (88%) | 4971 (99%) | 33 (1%)  | 80          | 86 |

All (33) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | C     | 328 | ARG  |
| 1   | C     | 333 | THR  |
| 1   | C     | 334 | ASN  |
| 1   | C     | 335 | LEU  |
| 1   | C     | 528 | LYS  |
| 1   | C     | 529 | LYS  |
| 1   | C     | 532 | ASN  |
| 1   | C     | 533 | LEU  |
| 1   | C     | 534 | VAL  |
| 1   | C     | 535 | LYS  |
| 2   | G     | 207 | CYS  |
| 3   | I     | 10  | VAL  |
| 4   | D     | 157 | VAL  |
| 4   | D     | 160 | LYS  |
| 4   | D     | 162 | ASP  |
| 4   | D     | 164 | SER  |
| 4   | D     | 167 | LYS  |
| 4   | D     | 171 | GLU  |
| 4   | D     | 194 | GLU  |
| 4   | D     | 197 | LYS  |
| 4   | D     | 201 | SER  |
| 5   | E     | 104 | ARG  |
| 5   | E     | 106 | ARG  |
| 5   | E     | 108 | ASP  |
| 1   | A     | 110 | LEU  |
| 1   | B     | 334 | ASN  |
| 1   | B     | 335 | LEU  |
| 1   | B     | 338 | PHE  |
| 1   | B     | 340 | GLU  |
| 2   | N     | 12  | LYS  |
| 5   | J     | 104 | ARG  |
| 5   | J     | 106 | ARG  |
| 5   | M     | 106 | ARG  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (67) such sidechains are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | C     | 99   | ASN  |
| 1   | C     | 134  | GLN  |
| 1   | C     | 354  | ASN  |
| 1   | C     | 439  | ASN  |
| 1   | C     | 448  | ASN  |
| 1   | C     | 450  | ASN  |
| 1   | C     | 506  | GLN  |
| 1   | C     | 655  | HIS  |
| 1   | C     | 675  | GLN  |
| 1   | C     | 703  | ASN  |
| 1   | C     | 755  | GLN  |
| 1   | C     | 774  | GLN  |
| 1   | C     | 913  | GLN  |
| 1   | C     | 920  | GLN  |
| 1   | C     | 949  | GLN  |
| 1   | C     | 955  | ASN  |
| 1   | C     | 957  | GLN  |
| 1   | C     | 965  | GLN  |
| 1   | C     | 969  | ASN  |
| 1   | C     | 1023 | ASN  |
| 1   | C     | 1048 | HIS  |
| 1   | C     | 1108 | ASN  |
| 2   | G     | 62   | GLN  |
| 3   | I     | 175  | ASN  |
| 4   | D     | 137  | GLN  |
| 1   | A     | 87   | ASN  |
| 1   | A     | 173  | GLN  |
| 1   | A     | 207  | HIS  |
| 1   | A     | 271  | GLN  |
| 1   | A     | 450  | ASN  |
| 1   | A     | 563  | GLN  |
| 1   | A     | 655  | HIS  |
| 1   | A     | 755  | GLN  |
| 1   | A     | 804  | GLN  |
| 1   | A     | 895  | GLN  |
| 1   | A     | 955  | ASN  |
| 1   | B     | 148  | ASN  |
| 1   | B     | 188  | ASN  |
| 1   | B     | 271  | GLN  |
| 1   | B     | 317  | ASN  |
| 1   | B     | 354  | ASN  |
| 1   | B     | 450  | ASN  |
| 1   | B     | 493  | GLN  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | B     | 532  | ASN  |
| 1   | B     | 655  | HIS  |
| 1   | B     | 675  | GLN  |
| 1   | B     | 762  | GLN  |
| 1   | B     | 901  | GLN  |
| 1   | B     | 919  | ASN  |
| 1   | B     | 955  | ASN  |
| 1   | B     | 965  | GLN  |
| 1   | B     | 969  | ASN  |
| 1   | B     | 1054 | GLN  |
| 1   | B     | 1058 | HIS  |
| 2   | H     | 62   | GLN  |
| 3   | L     | 113  | GLN  |
| 3   | L     | 175  | ASN  |
| 2   | N     | 62   | GLN  |
| 2   | N     | 175  | HIS  |
| 3   | O     | 36   | HIS  |
| 4   | F     | 8    | HIS  |
| 4   | F     | 35   | GLN  |
| 4   | F     | 119  | GLN  |
| 4   | F     | 137  | GLN  |
| 4   | K     | 38   | GLN  |
| 4   | K     | 137  | GLN  |
| 5   | M     | 100  | GLN  |

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

### 5.5 Carbohydrates [i](#)

24 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 |
| 6   | NAG  | P     | 1   | 1,6  | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.43 | 0        |
| 6   | NAG  | P     | 2   | 6    | 14,14,15     | 0.27 | 0        | 17,19,21    | 0.43 | 0        |
| 6   | NAG  | Q     | 1   | 1,6  | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.46 | 0        |
| 6   | NAG  | Q     | 2   | 6    | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.41 | 0        |
| 6   | NAG  | R     | 1   | 1,6  | 14,14,15     | 0.22 | 0        | 17,19,21    | 0.44 | 0        |
| 6   | NAG  | R     | 2   | 6    | 14,14,15     | 0.26 | 0        | 17,19,21    | 0.42 | 0        |
| 6   | NAG  | S     | 1   | 1,6  | 14,14,15     | 0.26 | 0        | 17,19,21    | 0.49 | 0        |
| 6   | NAG  | S     | 2   | 6    | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.43 | 0        |
| 6   | NAG  | T     | 1   | 1,6  | 14,14,15     | 0.23 | 0        | 17,19,21    | 0.43 | 0        |
| 6   | NAG  | T     | 2   | 6    | 14,14,15     | 0.26 | 0        | 17,19,21    | 0.42 | 0        |
| 6   | NAG  | U     | 1   | 1,6  | 14,14,15     | 0.27 | 0        | 17,19,21    | 0.49 | 0        |
| 6   | NAG  | U     | 2   | 6    | 14,14,15     | 0.25 | 0        | 17,19,21    | 0.42 | 0        |
| 6   | NAG  | V     | 1   | 1,6  | 14,14,15     | 0.19 | 0        | 17,19,21    | 0.41 | 0        |
| 6   | NAG  | V     | 2   | 6    | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.43 | 0        |
| 6   | NAG  | W     | 1   | 1,6  | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.47 | 0        |
| 6   | NAG  | W     | 2   | 6    | 14,14,15     | 0.26 | 0        | 17,19,21    | 0.44 | 0        |
| 6   | NAG  | X     | 1   | 1,6  | 14,14,15     | 0.25 | 0        | 17,19,21    | 0.43 | 0        |
| 6   | NAG  | X     | 2   | 6    | 14,14,15     | 0.26 | 0        | 17,19,21    | 0.43 | 0        |
| 6   | NAG  | Y     | 1   | 1,6  | 14,14,15     | 0.25 | 0        | 17,19,21    | 0.47 | 0        |
| 6   | NAG  | Y     | 2   | 6    | 14,14,15     | 0.27 | 0        | 17,19,21    | 0.41 | 0        |
| 6   | NAG  | Z     | 1   | 1,6  | 14,14,15     | 0.25 | 0        | 17,19,21    | 0.43 | 0        |
| 6   | NAG  | Z     | 2   | 6    | 14,14,15     | 0.27 | 0        | 17,19,21    | 0.40 | 0        |
| 6   | NAG  | a     | 1   | 1,6  | 14,14,15     | 0.28 | 0        | 17,19,21    | 0.50 | 0        |
| 6   | NAG  | a     | 2   | 6    | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.43 | 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   |
|-----|------|-------|-----|------|---------|-----------|---------|
| 6   | NAG  | P     | 1   | 1,6  | -       | 0/6/23/26 | 0/1/1/1 |
| 6   | NAG  | P     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | Q     | 1   | 1,6  | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | Q     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | R     | 1   | 1,6  | -       | 0/6/23/26 | 0/1/1/1 |
| 6   | NAG  | R     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | S     | 1   | 1,6  | -       | 2/6/23/26 | 0/1/1/1 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions  | Rings   |
|-----|------|-------|-----|------|---------|-----------|---------|
| 6   | NAG  | S     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | T     | 1   | 1,6  | -       | 0/6/23/26 | 0/1/1/1 |
| 6   | NAG  | T     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | U     | 1   | 1,6  | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | U     | 2   | 6    | -       | 0/6/23/26 | 0/1/1/1 |
| 6   | NAG  | V     | 1   | 1,6  | -       | 0/6/23/26 | 0/1/1/1 |
| 6   | NAG  | V     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | W     | 1   | 1,6  | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | W     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | X     | 1   | 1,6  | -       | 0/6/23/26 | 0/1/1/1 |
| 6   | NAG  | X     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | Y     | 1   | 1,6  | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | Y     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | Z     | 1   | 1,6  | -       | 0/6/23/26 | 0/1/1/1 |
| 6   | NAG  | Z     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | a     | 1   | 1,6  | -       | 2/6/23/26 | 0/1/1/1 |
| 6   | NAG  | a     | 2   | 6    | -       | 2/6/23/26 | 0/1/1/1 |

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (34) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms       |
|-----|-------|-----|------|-------------|
| 6   | S     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | W     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | a     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | Z     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | R     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | W     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | a     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | U     | 1   | NAG  | O5-C5-C6-O6 |
| 6   | S     | 1   | NAG  | O5-C5-C6-O6 |
| 6   | Y     | 1   | NAG  | O5-C5-C6-O6 |
| 6   | P     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | Q     | 1   | NAG  | O5-C5-C6-O6 |
| 6   | T     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | a     | 1   | NAG  | O5-C5-C6-O6 |

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| Mol | Chain | Res | Type | Atoms       |
|-----|-------|-----|------|-------------|
| 6   | S     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | V     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | P     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | Q     | 1   | NAG  | C4-C5-C6-O6 |
| 6   | T     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | a     | 1   | NAG  | C4-C5-C6-O6 |
| 6   | S     | 1   | NAG  | C4-C5-C6-O6 |
| 6   | U     | 1   | NAG  | C4-C5-C6-O6 |
| 6   | X     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | Z     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | V     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | Y     | 1   | NAG  | C4-C5-C6-O6 |
| 6   | X     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | R     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | W     | 1   | NAG  | O5-C5-C6-O6 |
| 6   | W     | 1   | NAG  | C4-C5-C6-O6 |
| 6   | Y     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | Q     | 2   | NAG  | C4-C5-C6-O6 |
| 6   | Y     | 2   | NAG  | O5-C5-C6-O6 |
| 6   | Q     | 2   | NAG  | O5-C5-C6-O6 |

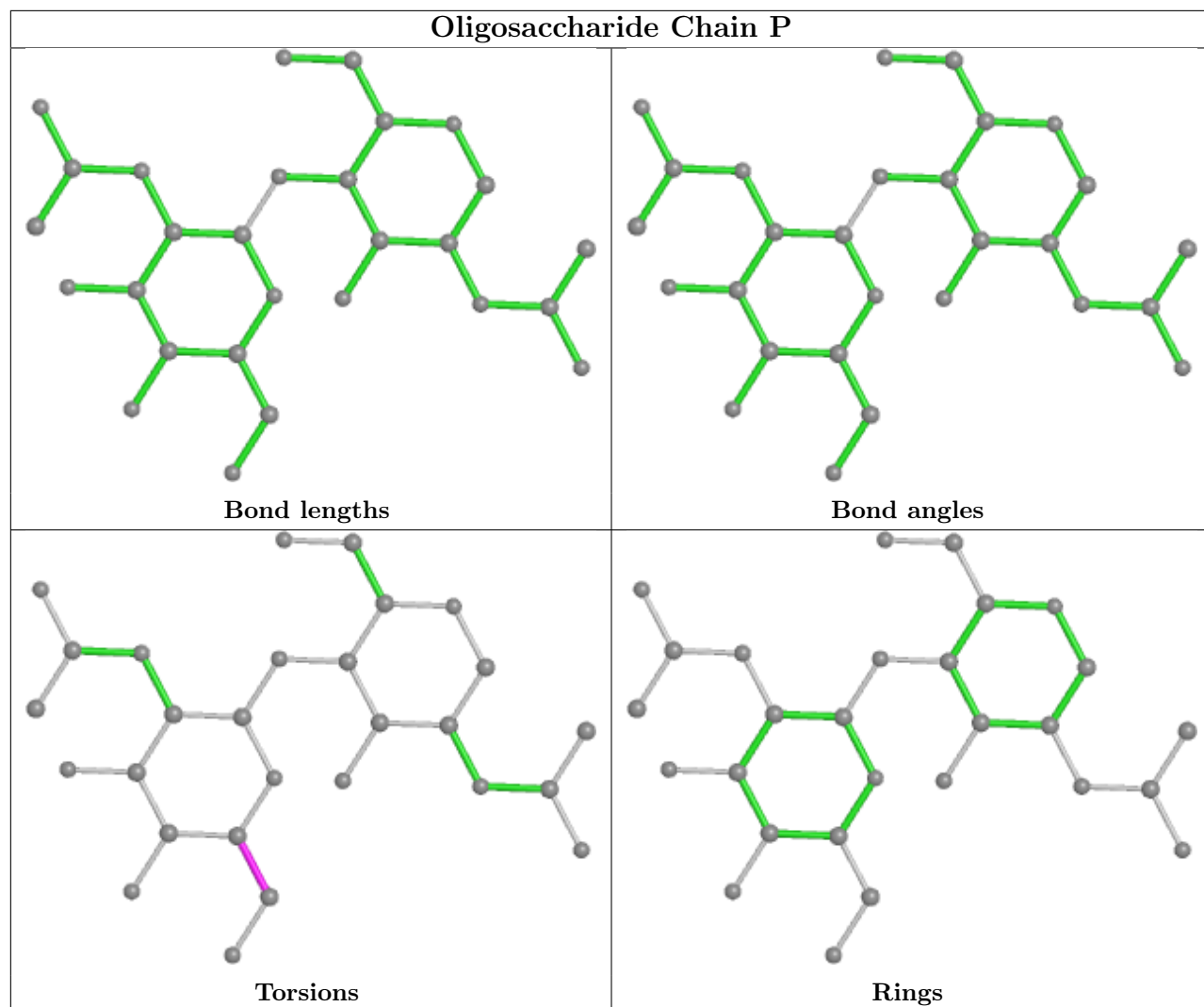
There are no ring outliers.

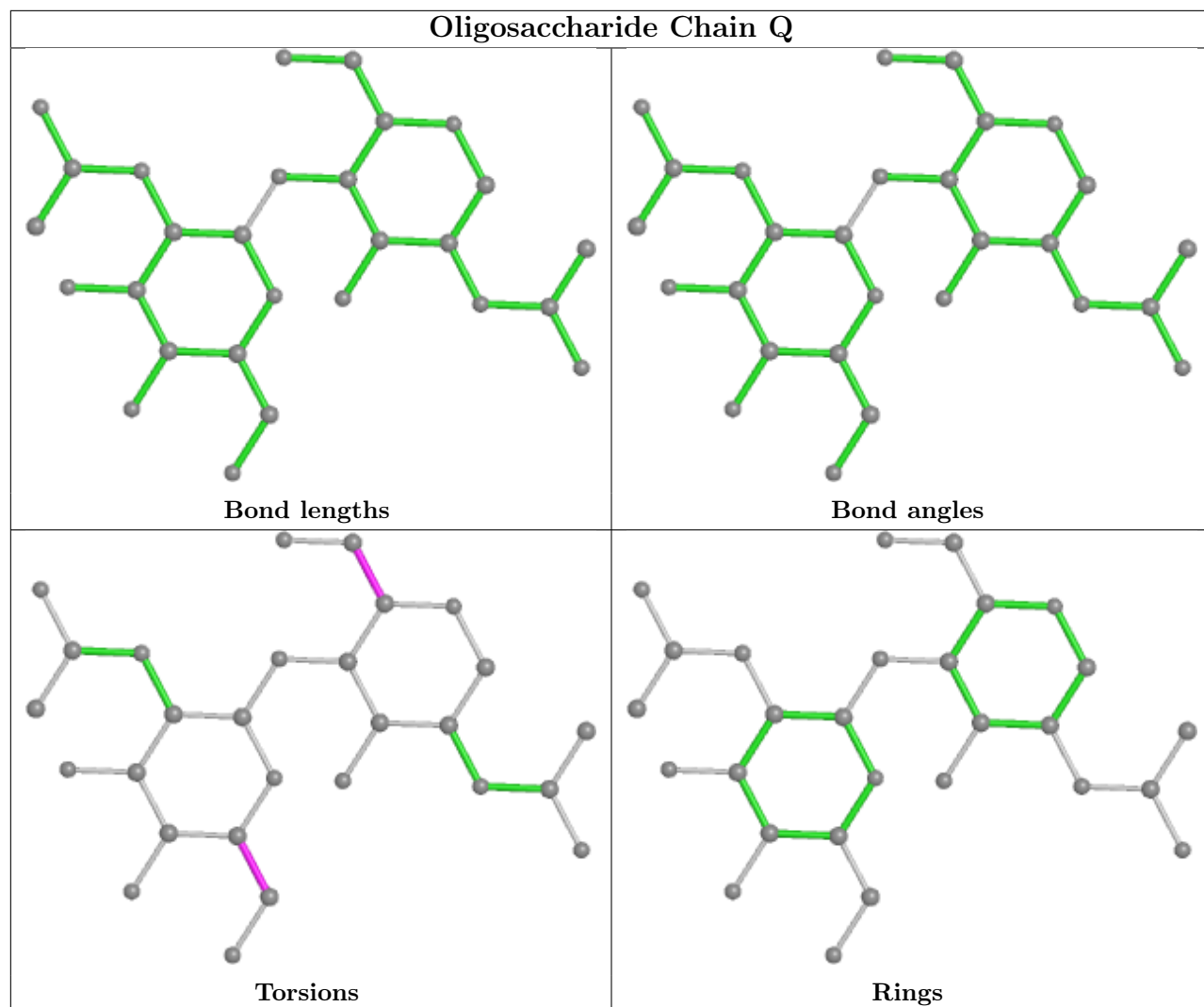
4 monomers are involved in 4 short contacts:

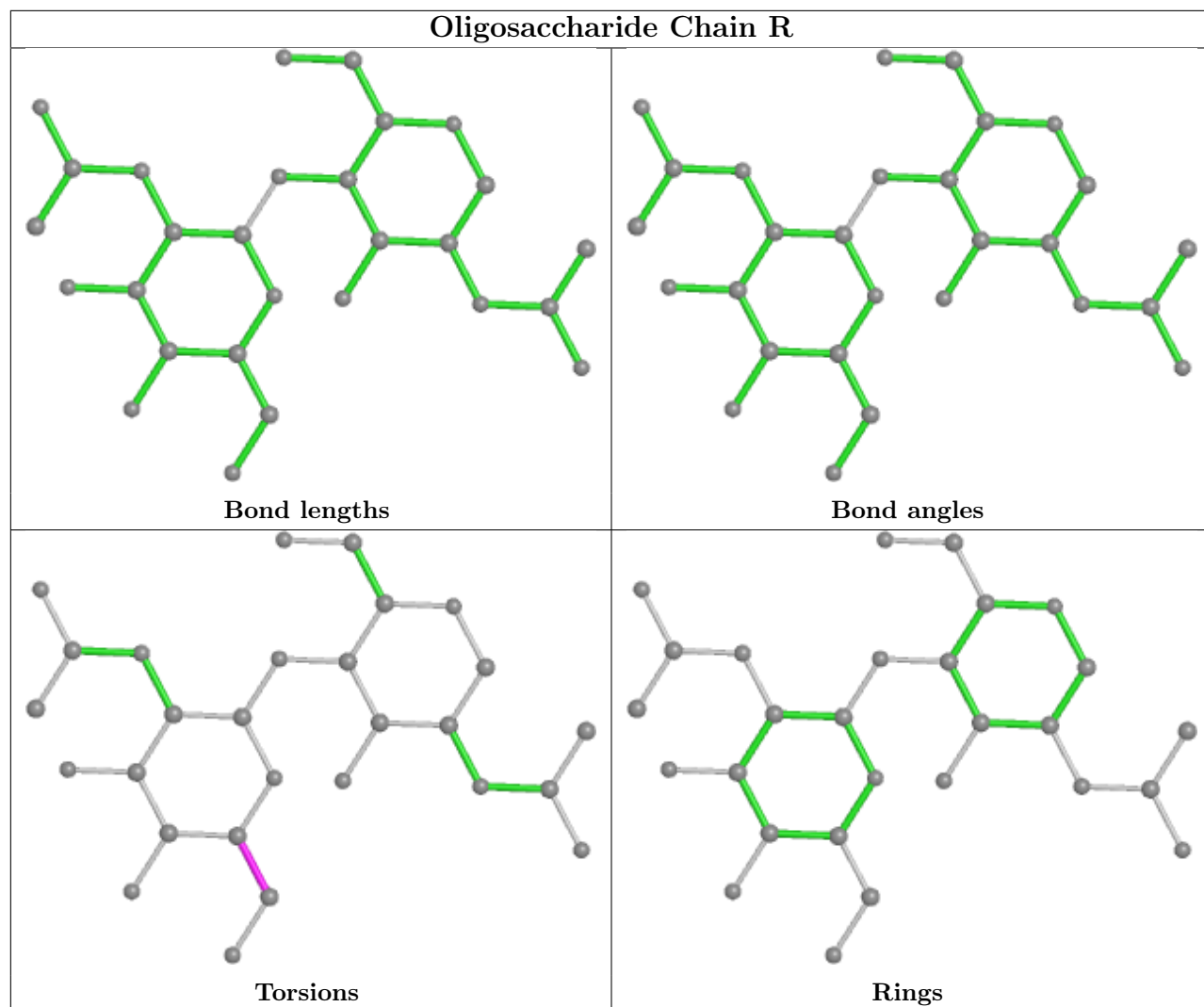
| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 6   | R     | 1   | NAG  | 1       | 0            |
| 6   | Z     | 1   | NAG  | 1       | 0            |
| 6   | X     | 1   | NAG  | 1       | 0            |
| 6   | P     | 1   | NAG  | 1       | 0            |

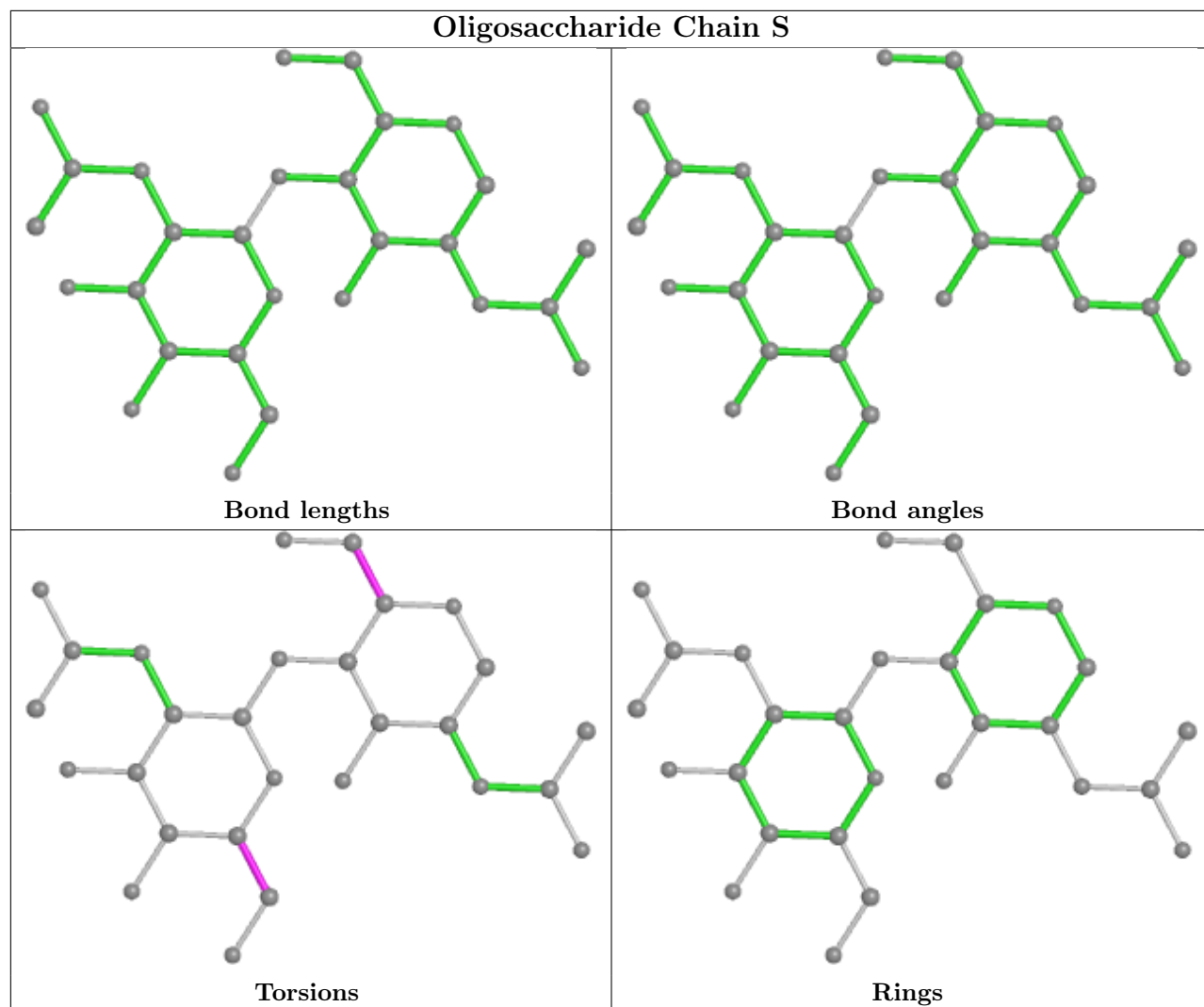
The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for oligosaccharide.

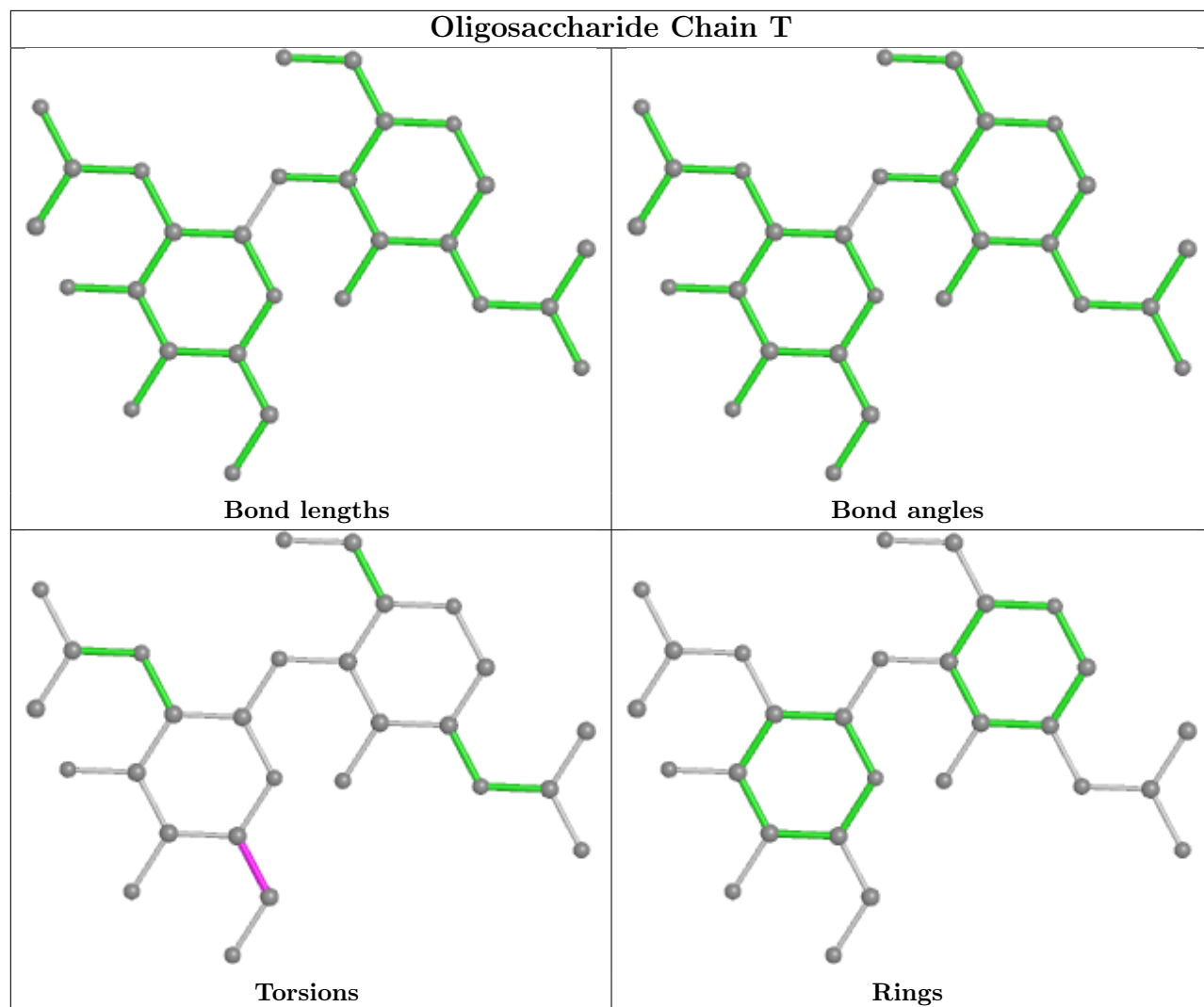


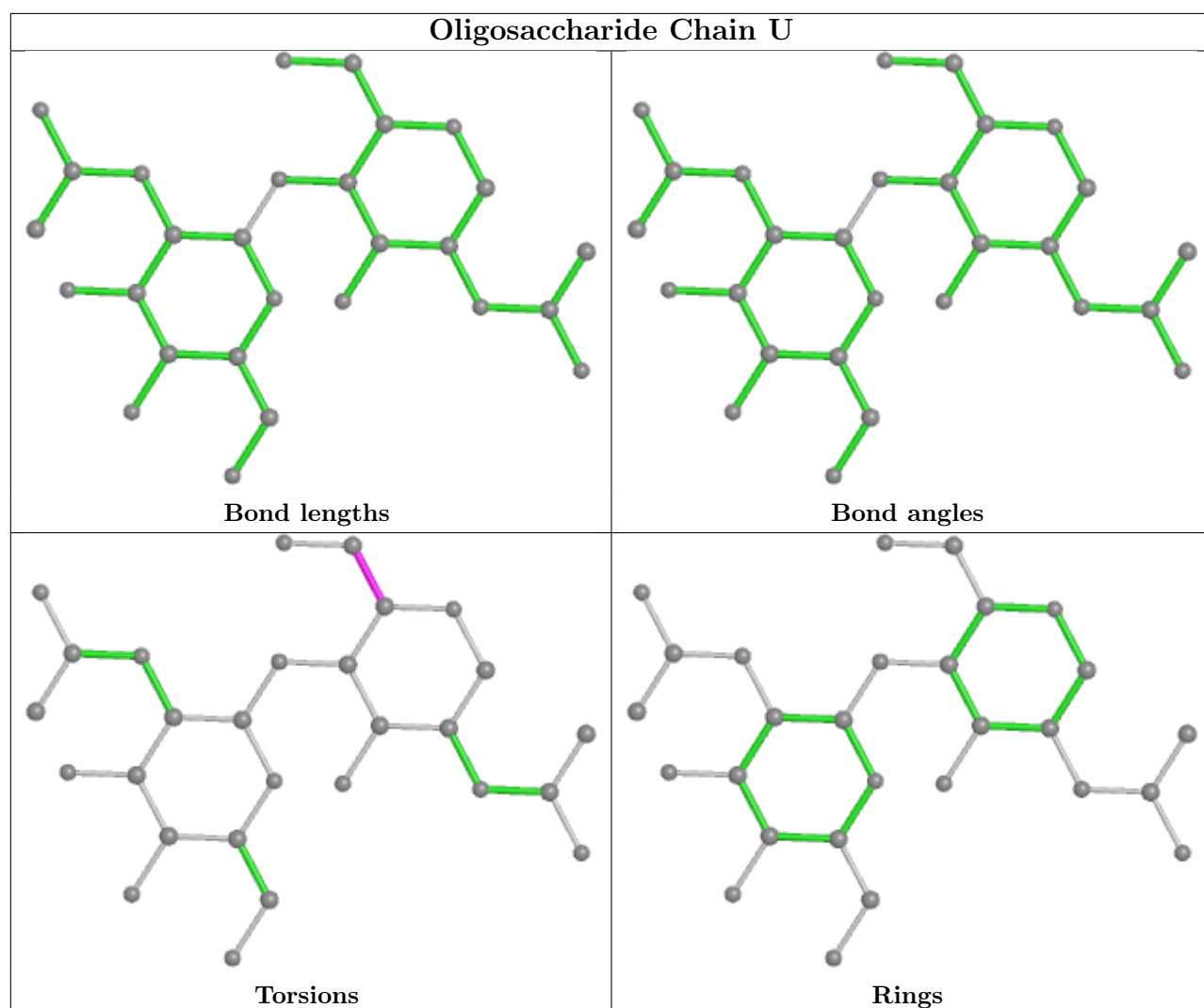


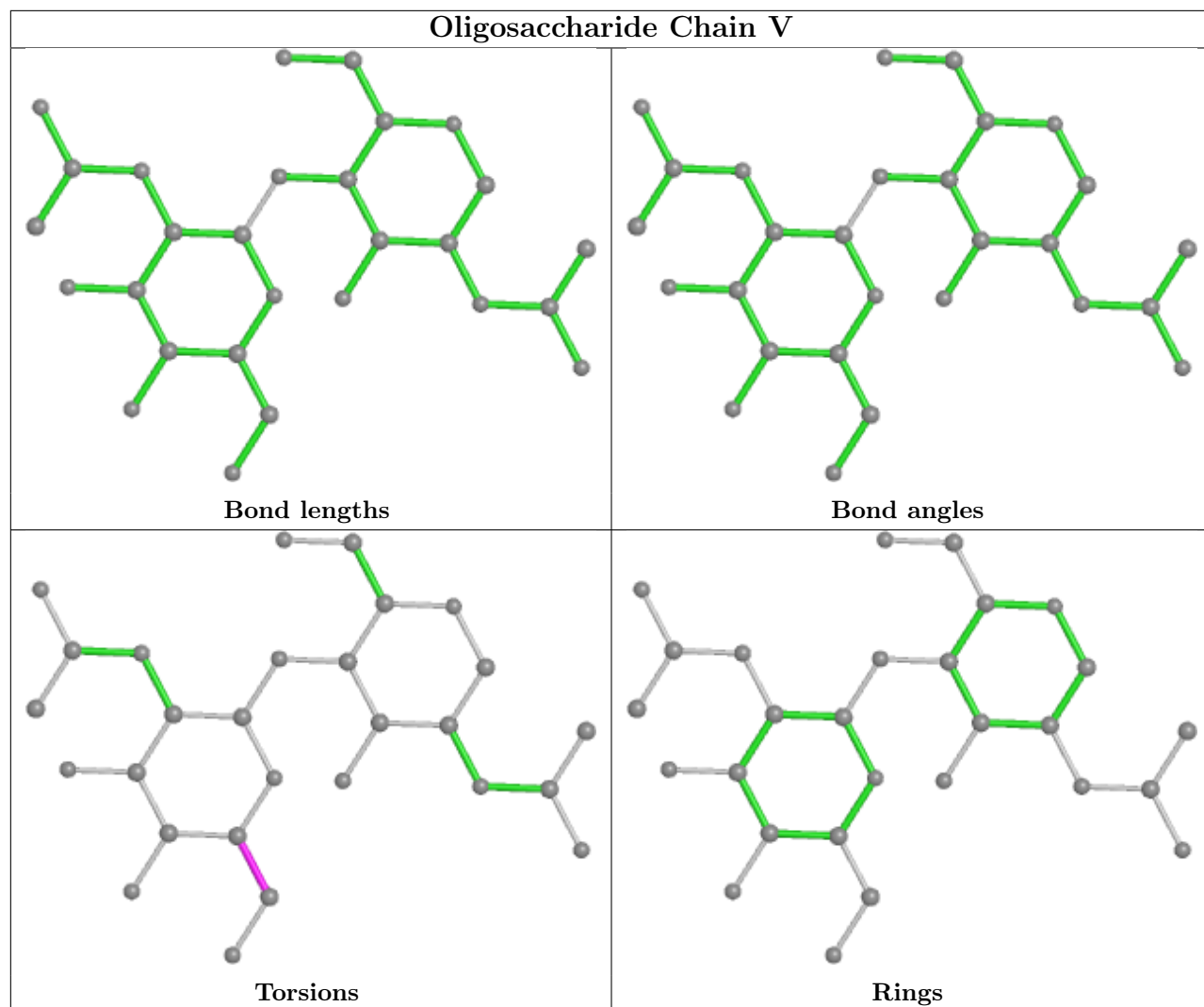


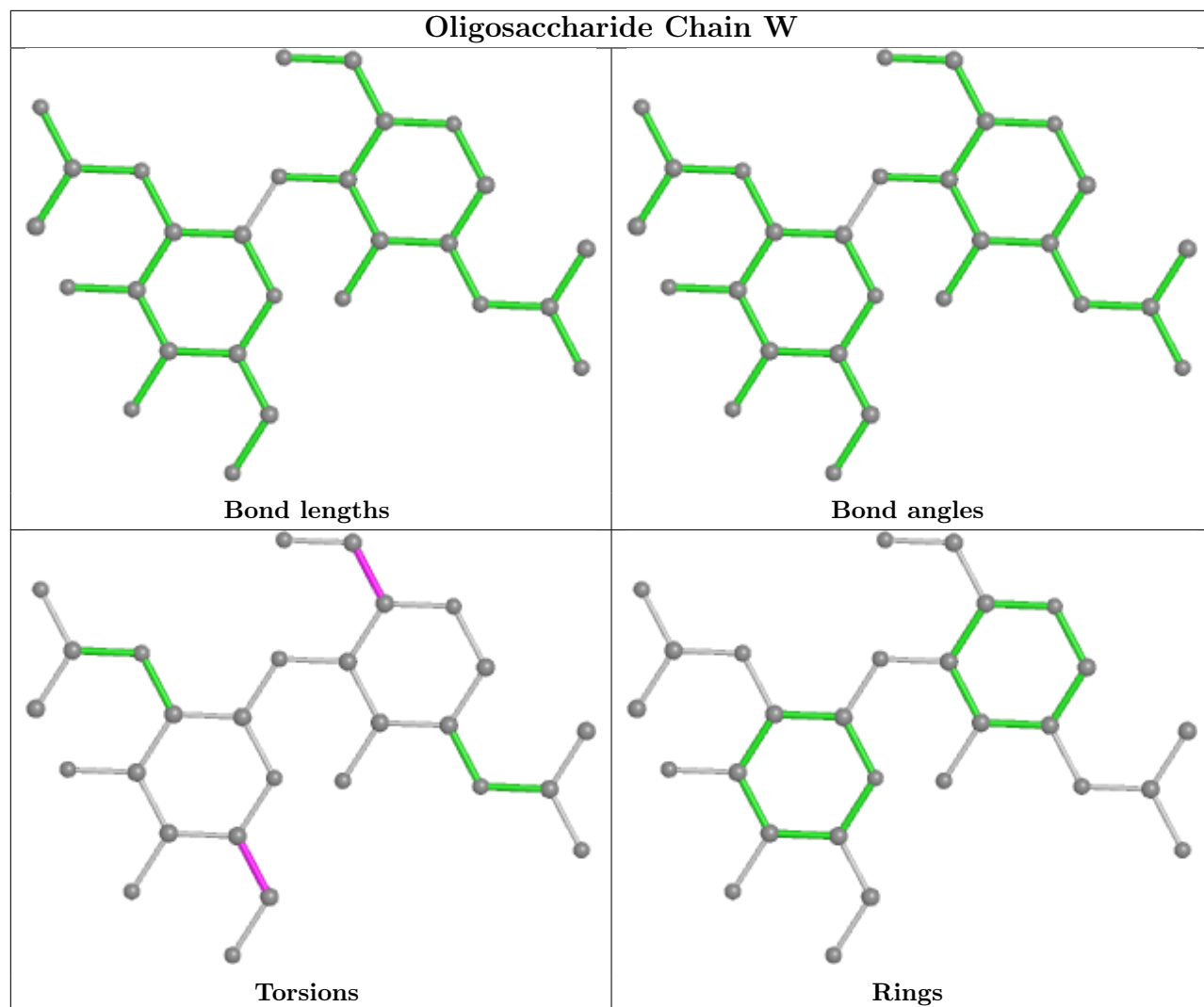




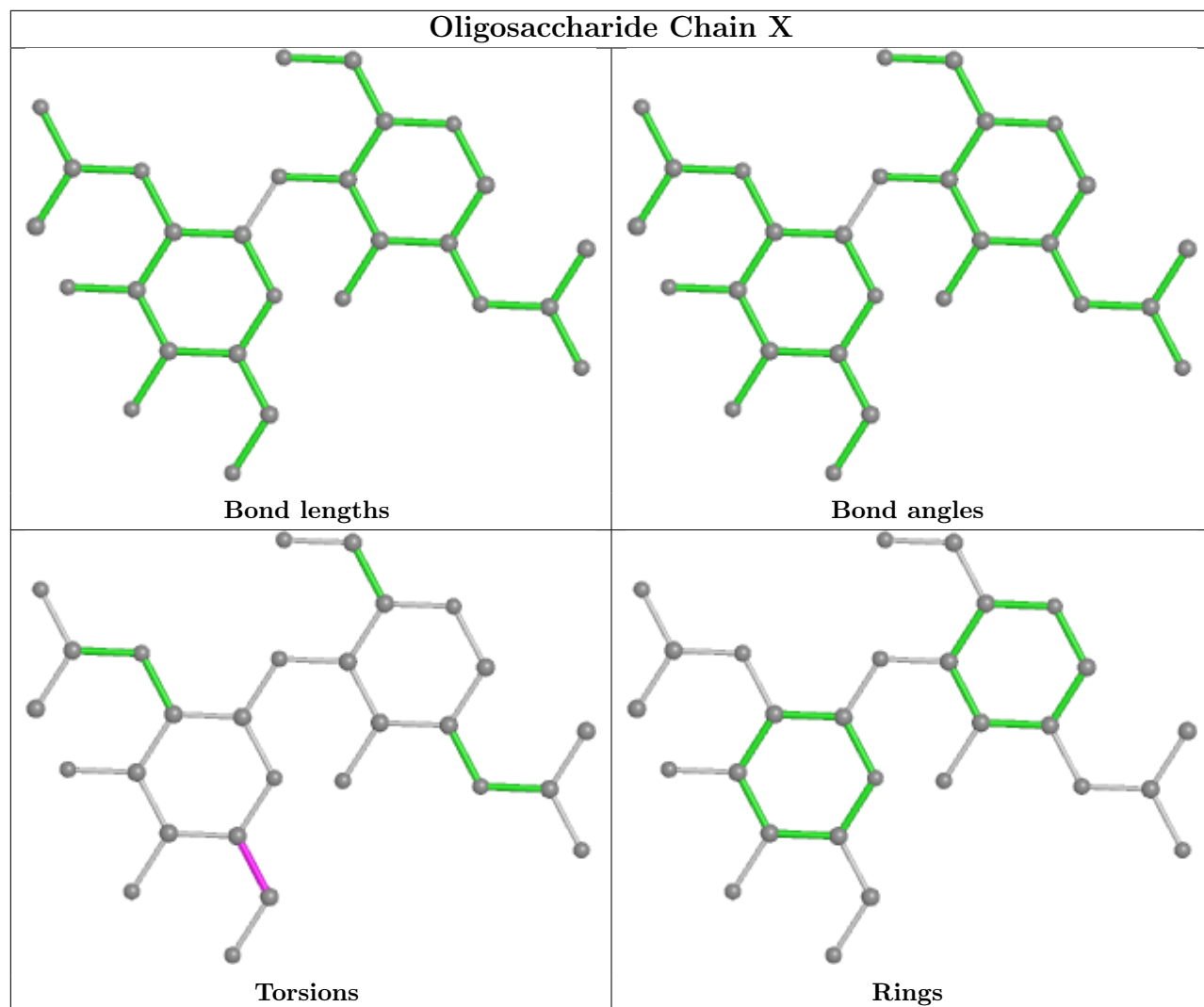


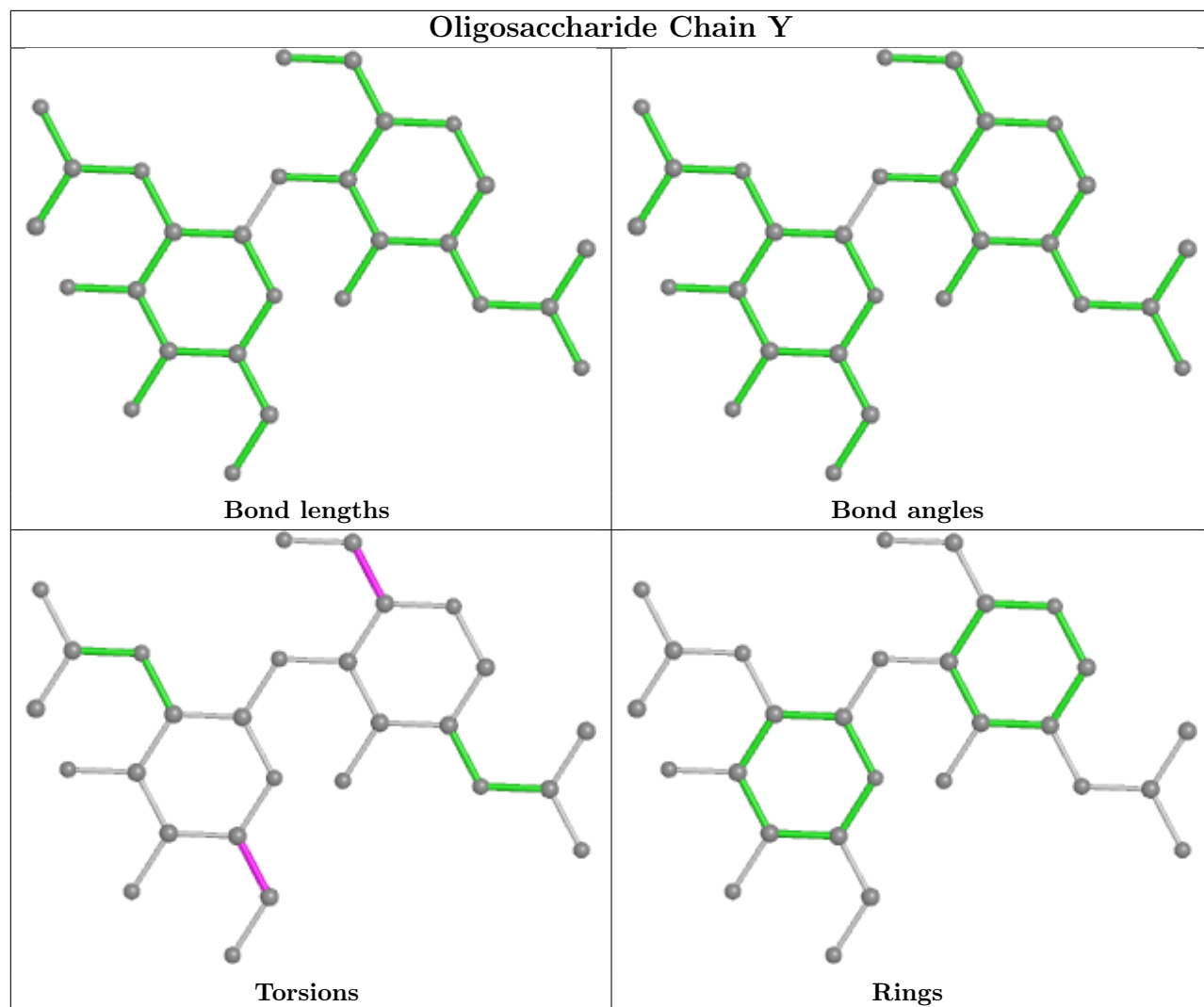


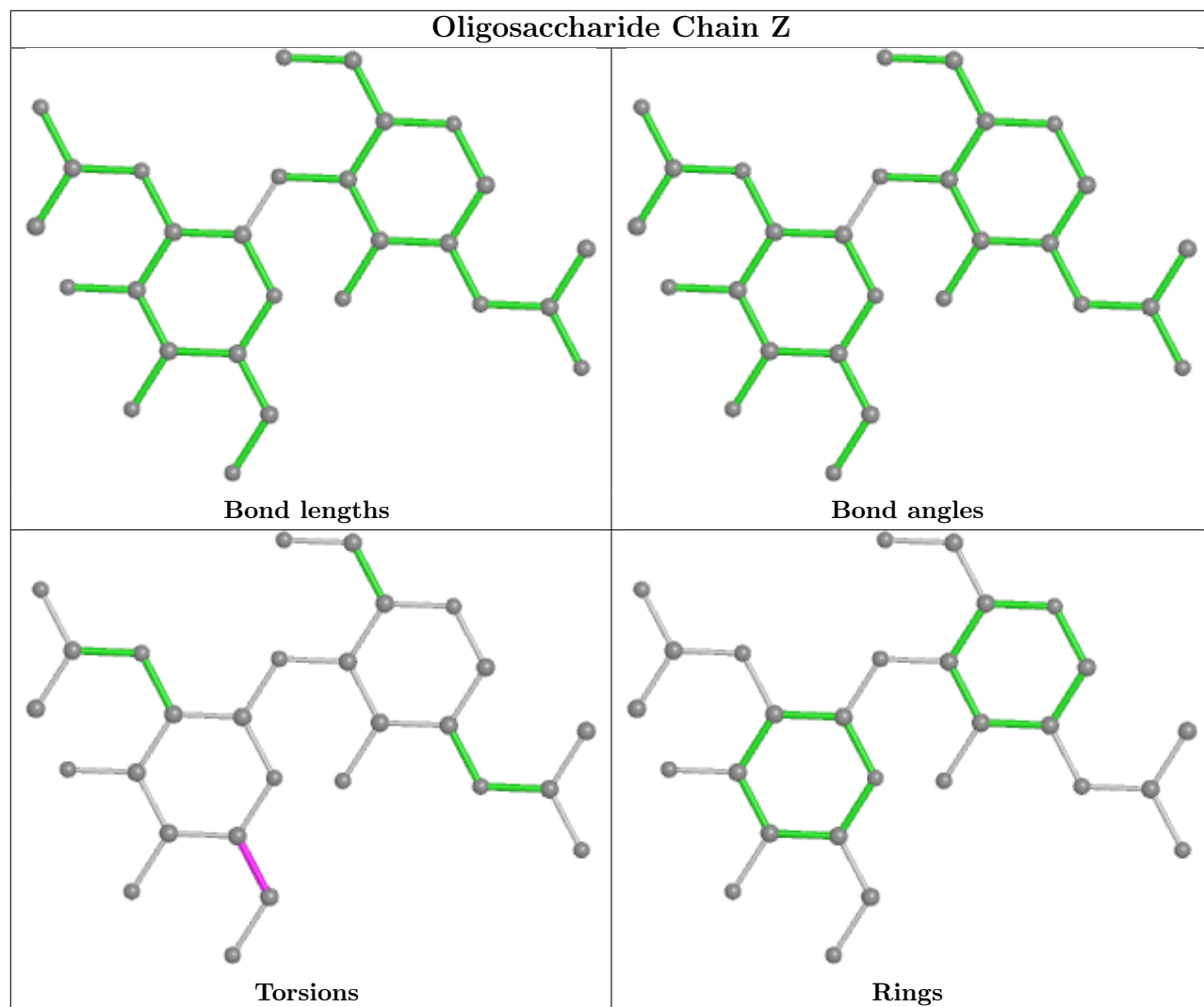


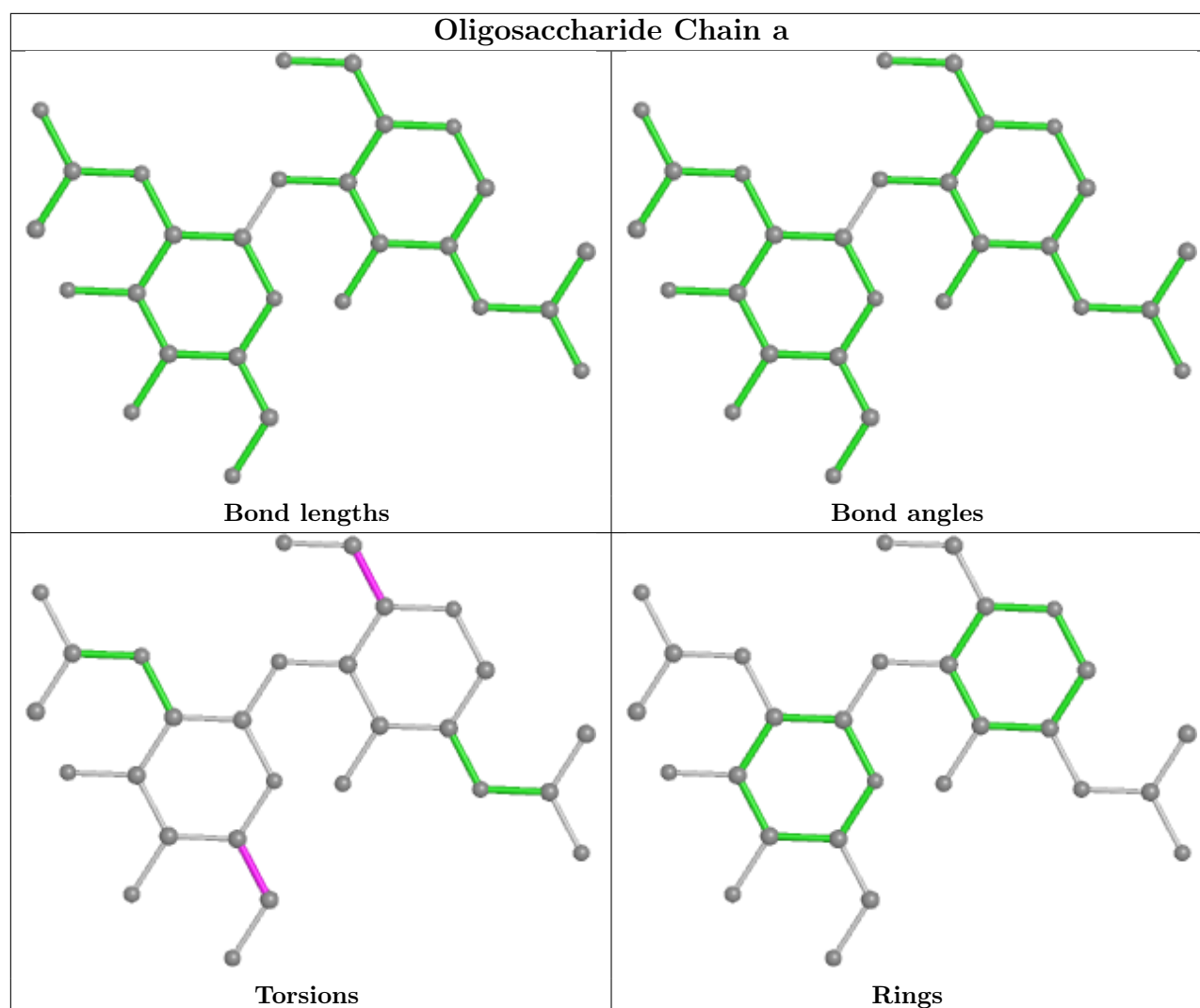












## 5.6 Ligand geometry [i](#)

33 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   | NAG  | A     | 1310 | 1    | 14,14,15     | 0.24 | 0           | 17,19,21    | 0.44 | 0           |
| 7   | NAG  | C     | 1310 | 1    | 14,14,15     | 0.26 | 0           | 17,19,21    | 0.44 | 0           |
| 7   | NAG  | B     | 1306 | 1    | 14,14,15     | 0.21 | 0           | 17,19,21    | 0.42 | 0           |
| 7   | NAG  | B     | 1310 | 1    | 14,14,15     | 0.27 | 0           | 17,19,21    | 0.45 | 0           |

| Mol | Type | Chain | Res  | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 7   | NAG  | C     | 1301 | 1    | 14,14,15     | 0.22 | 0        | 17,19,21    | 0.41 | 0        |
| 7   | NAG  | A     | 1301 | 1    | 14,14,15     | 0.35 | 0        | 17,19,21    | 0.48 | 0        |
| 7   | NAG  | C     | 1304 | 1    | 14,14,15     | 0.34 | 0        | 17,19,21    | 0.47 | 0        |
| 7   | NAG  | A     | 1308 | 1    | 14,14,15     | 0.25 | 0        | 17,19,21    | 0.43 | 0        |
| 7   | NAG  | B     | 1307 | 1    | 14,14,15     | 0.55 | 0        | 17,19,21    | 0.79 | 1 (5%)   |
| 7   | NAG  | B     | 1309 | 1    | 14,14,15     | 0.28 | 0        | 17,19,21    | 0.44 | 0        |
| 7   | NAG  | B     | 1305 | 1    | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.43 | 0        |
| 7   | NAG  | B     | 1304 | 1    | 14,14,15     | 0.32 | 0        | 17,19,21    | 0.58 | 1 (5%)   |
| 7   | NAG  | A     | 1311 | 1    | 14,14,15     | 0.25 | 0        | 17,19,21    | 0.44 | 0        |
| 7   | NAG  | C     | 1303 | 1    | 14,14,15     | 0.38 | 0        | 17,19,21    | 0.34 | 0        |
| 7   | NAG  | A     | 1306 | 1    | 14,14,15     | 0.32 | 0        | 17,19,21    | 0.38 | 0        |
| 7   | NAG  | B     | 1302 | 1    | 14,14,15     | 0.20 | 0        | 17,19,21    | 0.44 | 0        |
| 7   | NAG  | C     | 1307 | 1    | 14,14,15     | 0.37 | 0        | 17,19,21    | 0.71 | 0        |
| 7   | NAG  | B     | 1301 | 1    | 14,14,15     | 0.41 | 0        | 17,19,21    | 0.38 | 0        |
| 7   | NAG  | B     | 1308 | 1    | 14,14,15     | 0.26 | 0        | 17,19,21    | 0.43 | 0        |
| 7   | NAG  | C     | 1309 | 1    | 14,14,15     | 0.29 | 0        | 17,19,21    | 0.46 | 0        |
| 7   | NAG  | A     | 1303 | 1    | 14,14,15     | 0.50 | 0        | 17,19,21    | 0.53 | 0        |
| 7   | NAG  | B     | 1303 | 1    | 14,14,15     | 0.23 | 0        | 17,19,21    | 0.39 | 0        |
| 7   | NAG  | C     | 1305 | 1    | 14,14,15     | 0.29 | 0        | 17,19,21    | 0.44 | 0        |
| 7   | NAG  | A     | 1305 | 1    | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.42 | 0        |
| 7   | NAG  | A     | 1302 | 1    | 14,14,15     | 0.24 | 0        | 17,19,21    | 0.47 | 0        |
| 7   | NAG  | A     | 1307 | 1    | 14,14,15     | 0.34 | 0        | 17,19,21    | 0.72 | 0        |
| 7   | NAG  | A     | 1304 | 1    | 14,14,15     | 0.26 | 0        | 17,19,21    | 0.45 | 0        |
| 7   | NAG  | C     | 1311 | 1    | 14,14,15     | 0.54 | 0        | 17,19,21    | 0.71 | 1 (5%)   |
| 7   | NAG  | C     | 1306 | 1    | 14,14,15     | 0.22 | 0        | 17,19,21    | 0.42 | 0        |
| 7   | NAG  | A     | 1309 | 1    | 14,14,15     | 0.28 | 0        | 17,19,21    | 0.44 | 0        |
| 7   | NAG  | C     | 1302 | 1    | 14,14,15     | 0.40 | 0        | 17,19,21    | 0.32 | 0        |
| 7   | NAG  | C     | 1308 | 1    | 14,14,15     | 0.25 | 0        | 17,19,21    | 0.43 | 0        |
| 7   | NAG  | B     | 1311 | 1    | 14,14,15     | 0.30 | 0        | 17,19,21    | 0.49 | 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   | NAG  | A     | 1310 | 1    | -       | 0/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1310 | 1    | -       | 0/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1306 | 1    | -       | 4/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1310 | 1    | -       | 0/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1301 | 1    | -       | 2/6/23/26 | 0/1/1/1 |

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| Mol | Type | Chain | Res  | Link | Chirals | Torsions  | Rings   |
|-----|------|-------|------|------|---------|-----------|---------|
| 7   | NAG  | A     | 1301 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1304 | 1    | -       | 0/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 1308 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1307 | 1    | -       | 3/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1309 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1305 | 1    | -       | 0/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1304 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 1311 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1303 | 1    | -       | 0/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 1306 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1302 | 1    | -       | 0/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1307 | 1    | -       | 1/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1301 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1308 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1309 | 1    | -       | 1/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 1303 | 1    | -       | 0/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1303 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1305 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 1305 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 1302 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 1307 | 1    | -       | 3/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 1304 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1311 | 1    | -       | 0/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1306 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 1309 | 1    | -       | 1/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1302 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | C     | 1308 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | B     | 1311 | 1    | -       | 2/6/23/26 | 0/1/1/1 |

There are no bond length outliers.

All (3) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms    | Z    | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|------|-------------|----------|
| 7   | C     | 1311 | NAG  | C1-O5-C5 | 2.56 | 115.66      | 112.19   |
| 7   | B     | 1307 | NAG  | C1-O5-C5 | 2.05 | 114.97      | 112.19   |
| 7   | B     | 1304 | NAG  | C1-O5-C5 | 2.03 | 114.94      | 112.19   |

There are no chirality outliers.

All (49) torsion outliers are listed below:

| Mol | Chain | Res  | Type | Atoms       |
|-----|-------|------|------|-------------|
| 7   | A     | 1302 | NAG  | C4-C5-C6-O6 |
| 7   | A     | 1301 | NAG  | O5-C5-C6-O6 |
| 7   | A     | 1308 | NAG  | O5-C5-C6-O6 |
| 7   | A     | 1301 | NAG  | C4-C5-C6-O6 |
| 7   | C     | 1308 | NAG  | O5-C5-C6-O6 |
| 7   | A     | 1307 | NAG  | O5-C5-C6-O6 |
| 7   | C     | 1301 | NAG  | O5-C5-C6-O6 |
| 7   | A     | 1302 | NAG  | O5-C5-C6-O6 |
| 7   | B     | 1309 | NAG  | O5-C5-C6-O6 |
| 7   | B     | 1308 | NAG  | O5-C5-C6-O6 |
| 7   | B     | 1311 | NAG  | O5-C5-C6-O6 |
| 7   | B     | 1303 | NAG  | C4-C5-C6-O6 |
| 7   | B     | 1301 | NAG  | O5-C5-C6-O6 |
| 7   | C     | 1301 | NAG  | C4-C5-C6-O6 |
| 7   | B     | 1303 | NAG  | O5-C5-C6-O6 |
| 7   | C     | 1305 | NAG  | C4-C5-C6-O6 |
| 7   | C     | 1308 | NAG  | C4-C5-C6-O6 |
| 7   | A     | 1307 | NAG  | C4-C5-C6-O6 |
| 7   | B     | 1308 | NAG  | C4-C5-C6-O6 |
| 7   | C     | 1306 | NAG  | C8-C7-N2-C2 |
| 7   | C     | 1306 | NAG  | O7-C7-N2-C2 |
| 7   | A     | 1306 | NAG  | C8-C7-N2-C2 |
| 7   | A     | 1306 | NAG  | O7-C7-N2-C2 |
| 7   | B     | 1306 | NAG  | C8-C7-N2-C2 |
| 7   | B     | 1306 | NAG  | O7-C7-N2-C2 |
| 7   | B     | 1301 | NAG  | C4-C5-C6-O6 |
| 7   | B     | 1306 | NAG  | O5-C5-C6-O6 |
| 7   | A     | 1304 | NAG  | O5-C5-C6-O6 |
| 7   | A     | 1308 | NAG  | C4-C5-C6-O6 |
| 7   | B     | 1304 | NAG  | O5-C5-C6-O6 |
| 7   | B     | 1311 | NAG  | C4-C5-C6-O6 |
| 7   | C     | 1309 | NAG  | O5-C5-C6-O6 |
| 7   | B     | 1306 | NAG  | C4-C5-C6-O6 |
| 7   | C     | 1305 | NAG  | O5-C5-C6-O6 |
| 7   | A     | 1304 | NAG  | C4-C5-C6-O6 |
| 7   | C     | 1302 | NAG  | O5-C5-C6-O6 |
| 7   | B     | 1309 | NAG  | C4-C5-C6-O6 |
| 7   | A     | 1309 | NAG  | O5-C5-C6-O6 |
| 7   | B     | 1307 | NAG  | O5-C5-C6-O6 |
| 7   | B     | 1307 | NAG  | C4-C5-C6-O6 |
| 7   | B     | 1304 | NAG  | C4-C5-C6-O6 |
| 7   | A     | 1305 | NAG  | C4-C5-C6-O6 |

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| Mol | Chain | Res  | Type | Atoms       |
|-----|-------|------|------|-------------|
| 7   | A     | 1305 | NAG  | O5-C5-C6-O6 |
| 7   | A     | 1311 | NAG  | C4-C5-C6-O6 |
| 7   | C     | 1307 | NAG  | C3-C2-N2-C7 |
| 7   | A     | 1307 | NAG  | C3-C2-N2-C7 |
| 7   | B     | 1307 | NAG  | C3-C2-N2-C7 |
| 7   | A     | 1311 | NAG  | O5-C5-C6-O6 |
| 7   | C     | 1302 | NAG  | C4-C5-C6-O6 |

There are no ring outliers.

2 monomers are involved in 3 short contacts:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 7   | A     | 1306 | NAG  | 1       | 0            |
| 7   | C     | 1306 | NAG  | 2       | 0            |

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.