



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 24, 2024 – 10:17 PM EDT

PDB ID : 6CH7  
Title : XFEL crystal structure of a natively-glycosylated BG505 SOSIP.664 HIV-1 Envelope Trimer in complex with the broadly-neutralizing antibodies BG18 and 35O22  
Authors : Barnes, C.O.; Bjorkman, P.J.  
Deposited on : 2018-02-22  
Resolution : 3.80 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The 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:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.37.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

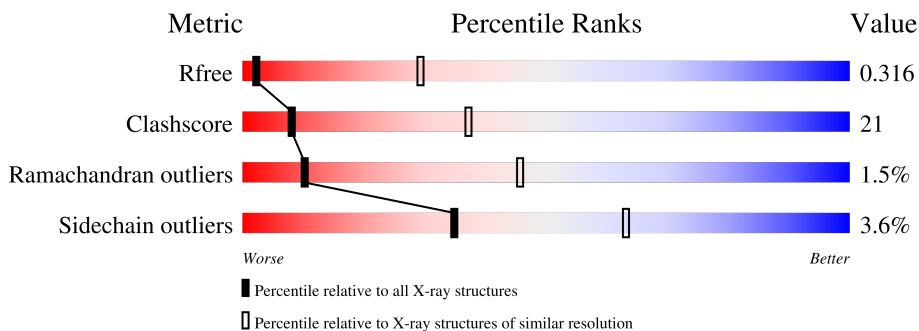
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.80 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.




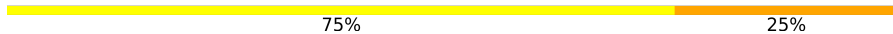
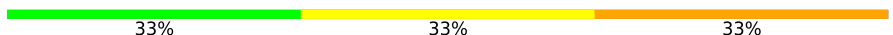
| Metric                | Whole archive (#Entries) | Similar resolution (#Entries, resolution range(Å)) |
|-----------------------|--------------------------|--|
| $R_{free}$            | 130704                   | 1212 (4.00-3.60)                                   |
| Clashscore            | 141614                   | 1288 (4.00-3.60)                                   |
| Ramachandran outliers | 138981                   | 1243 (4.00-3.60)                                   |
| Sidechain outliers    | 138945                   | 1237 (4.00-3.60)                                   |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower 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   | B     | 153    | 63% (green), 23% (yellow), 12% (grey)            |
| 2   | D     | 243    | 58% (green), 33% (yellow), 7% (grey)             |
| 3   | E     | 216    | 63% (green), 32% (yellow), 5% (orange), 2% (red) |
| 4   | G     | 479    | 59% (green), 33% (yellow), 6% (grey)             |
| 5   | Q     | 241    | 65% (green), 27% (yellow), 5% (orange), 3% (red) |
| 6   | R     | 215    | 58% (green), 36% (yellow), 5% (orange), 2% (red) |
| 7   | A     | 5      | 60% (green), 40% (yellow)                        |

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| Mol | Chain | Length | Quality of chain   |
|-----|-------|--------|--|
| 8   | C     | 8      |  12% 62% 25%   |
| 9   | F     | 8      |  88% 12%       |
| 10  | H     | 3      |  33% 33% 33%   |
| 10  | J     | 3      |  67% 33%       |
| 10  | M     | 3      |  33% 67%       |
| 11  | I     | 4      |  75% 25%       |
| 12  | K     | 7      |  71% 29%       |
| 13  | L     | 6      |  33% 17% 50%   |
| 14  | N     | 2      |  50% 50%       |
| 15  | O     | 7      |  57% 43%       |
| 16  | P     | 7      |  57% 29% 14%   |
| 17  | S     | 6      |  33% 33% 33%  |
| 18  | T     | 9      |  22% 44% 33% |

## 2 Entry composition [i](#)

There are 19 unique types of molecules in this entry. The entry contains 12160 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Envelope glycoprotein gp41.

| Mol | Chain | Residues | Atoms |     |     |     |   | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |         |       |
| 1   | B     | 134      | 1068  | 675 | 186 | 201 | 6 | 0       | 0       | 0     |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment             | Reference  |
|-------|---------|----------|--------|---------------------|------------|
| B     | 605     | CYS      | THR    | engineered mutation | UNP Q2N0S7 |

- Molecule 2 is a protein called 35O22 Heavy Chain.

| Mol | Chain | Residues | Atoms |      |     |     |   | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |         |       |
| 2   | D     | 226      | 1708  | 1086 | 287 | 328 | 7 | 0       | 0       | 0     |

- Molecule 3 is a protein called 35O22 Light Chain.

| Mol | Chain | Residues | Atoms |      |     |     |   | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |         |       |
| 3   | E     | 213      | 1615  | 1012 | 267 | 328 | 8 | 0       | 0       | 0     |

- Molecule 4 is a protein called Envelope glycoprotein gp120.

| Mol | Chain | Residues | Atoms |      |     |     |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|---------|-------|
|     |       |          | Total | C    | N   | O   | S  |         |         |       |
| 4   | G     | 452      | 3546  | 2224 | 628 | 667 | 27 | 0       | 0       | 0     |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference  |
|-------|---------|----------|--------|----------|------------|
| G     | 152     | THR      | GLY    | conflict | UNP Q2N0S6 |
| G     | 332     | ASN      | THR    | conflict | UNP Q2N0S6 |
| G     | 501     | CYS      | ALA    | conflict | UNP Q2N0S6 |

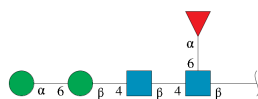
- Molecule 5 is a protein called BG18 Heavy Chain.

| Mol | Chain | Residues | Atoms |      |     |     |   | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|---------|-------|
|     |       |          | Total | C    | N   | O   | S |         |         |       |
| 5   | Q     | 231      | 1709  | 1077 | 291 | 333 | 8 | 0       | 0       | 0     |

- Molecule 6 is a protein called BG18 Light Chain.

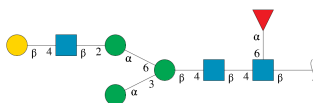
| Mol | Chain | Residues | Atoms |     |     |     |   | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|---------|-------|
|     |       |          | Total | C   | N   | O   | S |         |         |       |
| 6   | R     | 211      | 1527  | 958 | 255 | 308 | 6 | 0       | 0       | 0     |

- Molecule 7 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



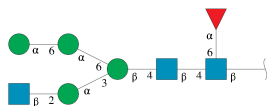
| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 7   | A     | 5        | 60    | 34 | 2 | 24 | 0       | 0       | 0     |

- Molecule 8 is an oligosaccharide called beta-D-galactopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



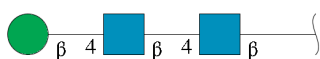
| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 8   | C     | 8        | 96    | 54 | 3 | 39 | 0       | 0       | 0     |

- Molecule 9 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose.



| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 9   | F     | 8        | 96    | 54 | 3 | 39 | 0       | 0       | 0     |

- Molecule 10 is an oligosaccharide called beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



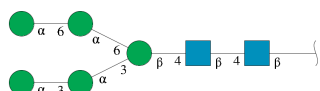
| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 10  | H     | 3        | 39    | 22 | 2 | 15 | 0       | 0       | 0     |
| 10  | J     | 3        | 39    | 22 | 2 | 15 | 0       | 0       | 0     |
| 10  | M     | 3        | 39    | 22 | 2 | 15 | 0       | 0       | 0     |

- Molecule 11 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



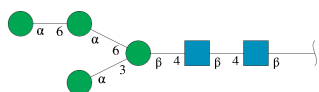
| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 11  | I     | 4        | 50    | 28 | 2 | 20 | 0       | 0       | 0     |

- Molecule 12 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 12  | K     | 7        | 83    | 46 | 2 | 35 | 0       | 0       | 0     |

- Molecule 13 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



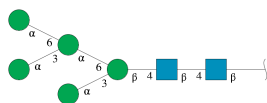
| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 13  | L     | 6        | 72    | 40 | 2 | 30 | 0       | 0       | 0     |

- Molecule 14 is an oligosaccharide called 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 14  | N     | 2        | 28    | 16 | 2 | 10 | 0       | 0       | 0     |

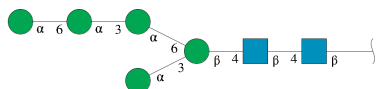
- Molecule 15 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 15  | O     | 7        | 83    | 46 | 2 | 35 | 0       | 0       | 0     |

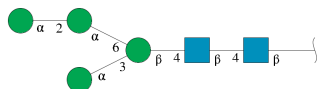
- Molecule 16 is an oligosaccharide called alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.

ucopyranose.



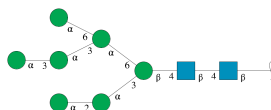
| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 16  | P     | 7        | 83    | 46 | 2 | 35 | 0       | 0       | 0     |

- Molecule 17 is an oligosaccharide called alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 17  | S     | 6        | 72    | 40 | 2 | 30 | 0       | 0       | 0     |

- Molecule 18 is an oligosaccharide called alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose.



| Mol | Chain | Residues | Atoms |    |   |    | ZeroOcc | AltConf | Trace |
|-----|-------|----------|-------|----|---|----|---------|---------|-------|
|     |       |          | Total | C  | N | O  |         |         |       |
| 18  | T     | 9        | 105   | 58 | 2 | 45 | 0       | 0       | 0     |

- Molecule 19 is 2-acetamido-2-deoxy-beta-D-glucopyranose (three-letter code: NAG) (formula: C<sub>8</sub>H<sub>15</sub>NO<sub>6</sub>).





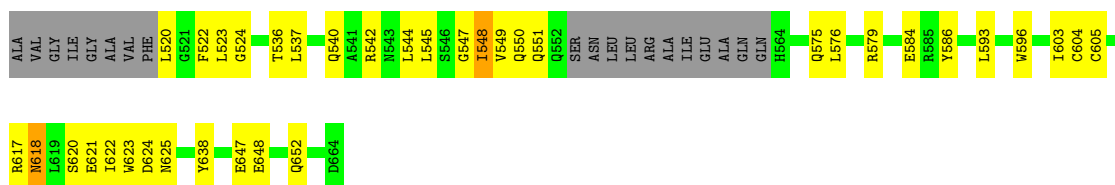
| Mol | Chain | Residues | Atoms |   |   |   | ZeroOcc | AltConf |
|-----|-------|----------|-------|---|---|---|---------|---------|
|     |       |          | Total | C | N | O |         |         |
| 19  | B     | 1        | 14    | 8 | 1 | 5 | 0       | 0       |
| 19  | G     | 1        | 14    | 8 | 1 | 5 | 0       | 0       |
| 19  | G     | 1        | 14    | 8 | 1 | 5 | 0       | 0       |

### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

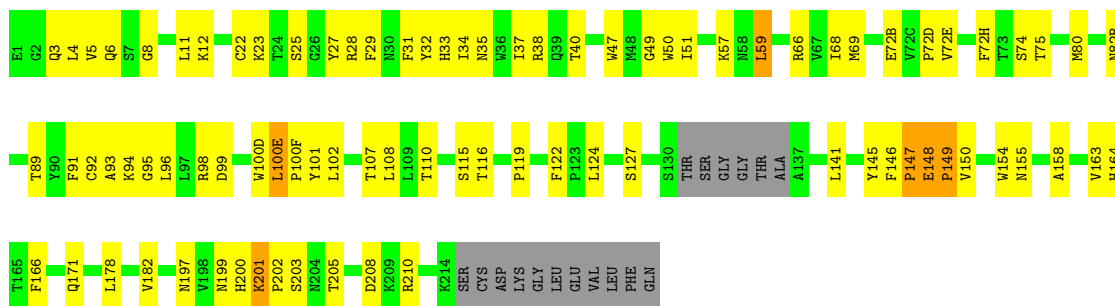
- Molecule 1: Envelope glycoprotein gp41

Chain B: 



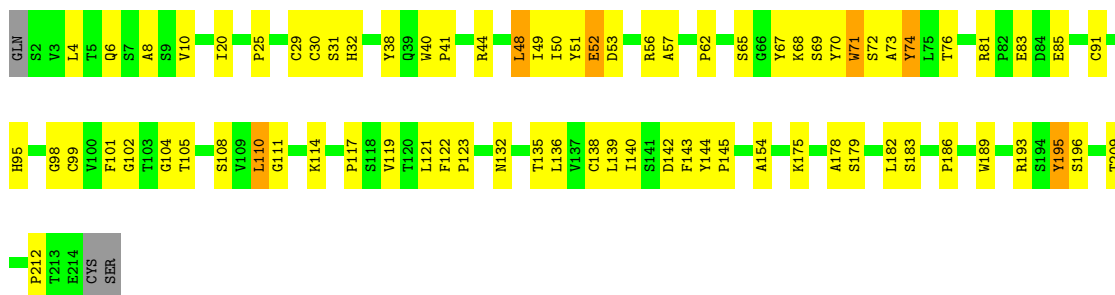
- Molecule 2: 35O22 Heavy Chain

Chain D: 



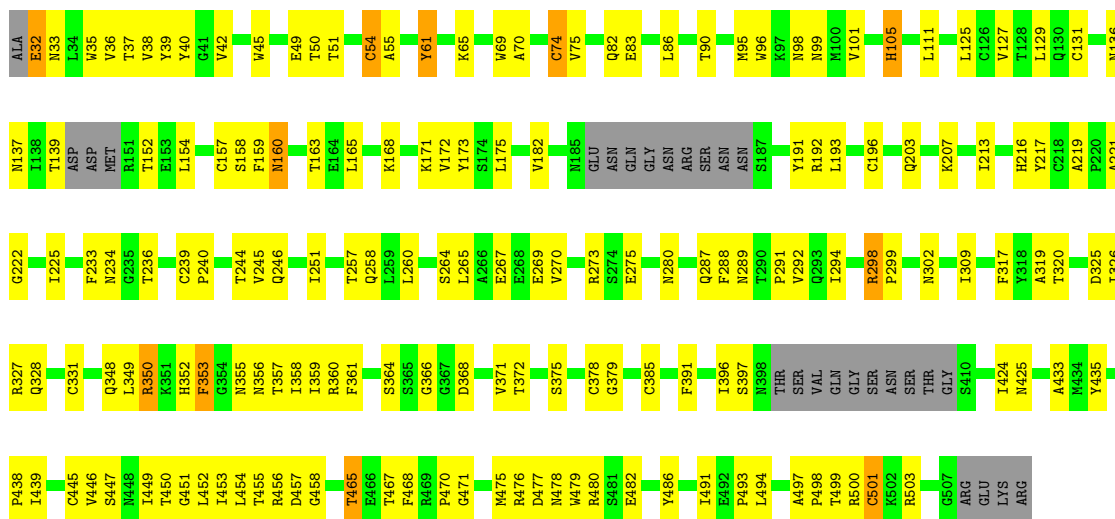
- Molecule 3: 35O22 Light Chain

Chain E: 



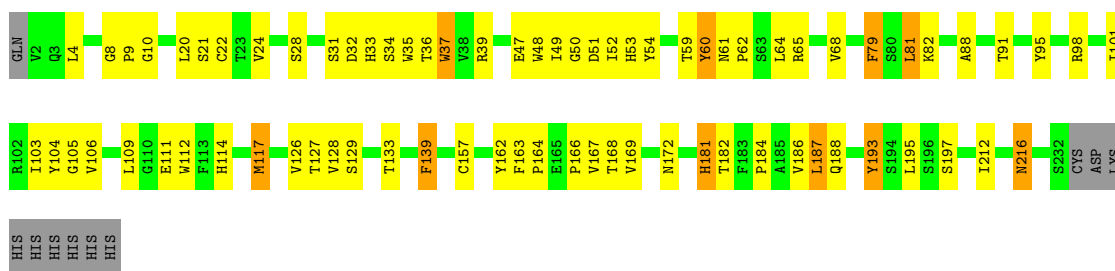
- Molecule 4: Envelope glycoprotein gp120

Chain G:  59% 33% 6%



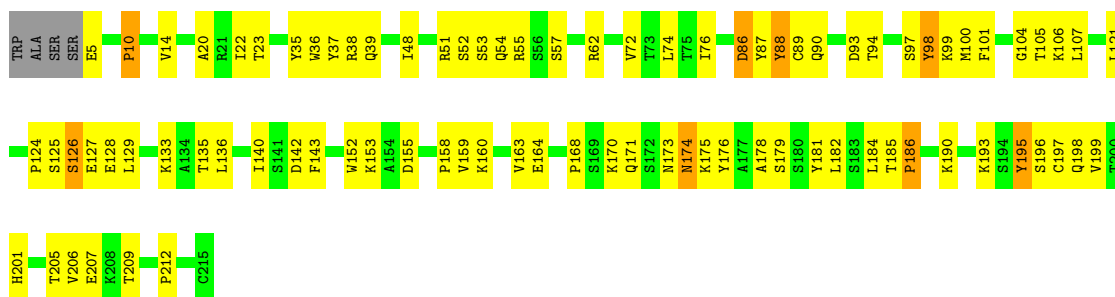
• Molecule 5: BG18 Heavy Chain

Chain Q:  65% 27% 8%



• Molecule 6: BG18 Light Chain

Chain R:  58% 36% 6%

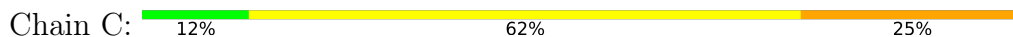


• Molecule 7: alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose

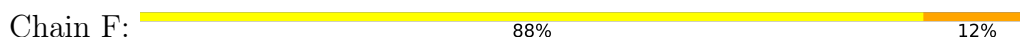
Chain A:  60% 40%



- Molecule 8: beta-D-galactopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 9: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-2)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-[alpha-L-fucopyranose-(1-6)]2-acetamido-2-deoxy-beta-D-glucopyranose



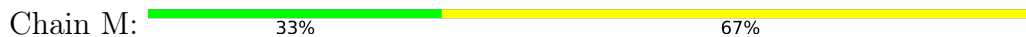
- Molecule 10: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 10: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 10: beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

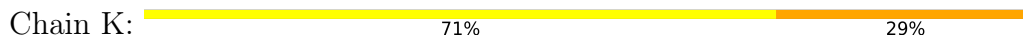


- Molecule 11: alpha-D-mannopyranose-(1-6)-beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

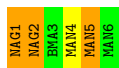
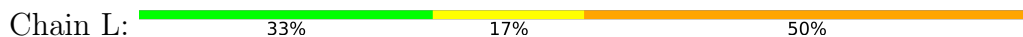




- Molecule 12: alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



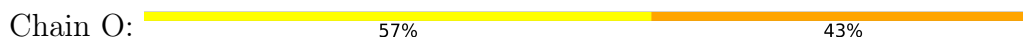
- Molecule 13: alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 14: 2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose



- Molecule 15: alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

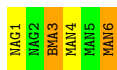


- Molecule 16: alpha-D-mannopyranose-(1-6)-alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

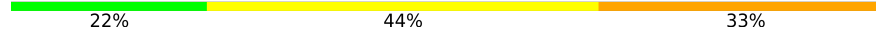


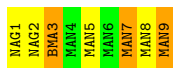
- Molecule 17: alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain S:  33% 33% 33%



- Molecule 18: alpha-D-mannopyranose-(1-3)-alpha-D-mannopyranose-(1-3)-[alpha-D-mannopyranose-(1-6)]alpha-D-mannopyranose-(1-6)-[alpha-D-mannopyranose-(1-2)-alpha-D-mannopyranose-(1-3)]beta-D-mannopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose-(1-4)-2-acetamido-2-deoxy-beta-D-glucopyranose

Chain T:  22% 44% 33%



## 4 Data and refinement statistics

| Property  | Value   | Source           |
|---|---|------------------|
| Space group   | H 3 2   | Depositor        |
| Cell constants<br>a, b, c, $\alpha$ , $\beta$ , $\gamma$                | 238.94Å 238.94Å 354.01Å<br>90.00° 90.00° 120.00°            | Depositor        |
| Resolution (Å)  | 24.03 – 3.80<br>24.00 – 3.80                                | Depositor<br>EDS |
| % Data completeness<br>(in resolution range)                            | 93.9 (24.03-3.80)<br>93.9 (24.00-3.80)                      | Depositor<br>EDS |
| $R_{merge}$   | 0.54  | Depositor        |
| $R_{sym}$   | (Not available)   | Depositor        |
| $\langle I/\sigma(I) \rangle$ <sup>1</sup>                              | 1.07 (at 3.84Å)   | Xtrriage         |
| Refinement program  | BUSTER 2.10.3   | Depositor        |
| R, $R_{free}$   | 0.232 , 0.262<br>0.298 , 0.316                              | Depositor<br>DCC |
| $R_{free}$ test set   | 1809 reflections (5.03%)                                    | wwPDB-VP         |
| Wilson B-factor (Å <sup>2</sup> )                                       | 175.6   | Xtrriage         |
| Anisotropy  | 0.210   | Xtrriage         |
| Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> ) | 0.19 , 103.8  | EDS              |
| L-test for twinning <sup>2</sup>  | $\langle  L  \rangle = 0.30$ , $\langle L^2 \rangle = 0.14$ | Xtrriage         |
| Estimated twinning fraction   | No twinning to report.                                      | Xtrriage         |
| $F_o, F_c$ correlation  | 0.92  | EDS              |
| Total number of atoms   | 12160   | wwPDB-VP         |
| Average B, all atoms (Å <sup>2</sup> )                                  | 213.0   | wwPDB-VP         |

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.49% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 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: BMA, FUC, GAL, MAN, 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   | B     | 0.33         | 0/1086      | 0.51        | 0/1472         |
| 2   | D     | 0.27         | 0/1752      | 0.52        | 0/2385         |
| 3   | E     | 0.27         | 0/1659      | 0.48        | 0/2269         |
| 4   | G     | 0.28         | 0/3619      | 0.50        | 0/4914         |
| 5   | Q     | 0.26         | 0/1753      | 0.49        | 0/2397         |
| 6   | R     | 0.26         | 0/1567      | 0.58        | 1/2149 (0.0%)  |
| All | All   | 0.28         | 0/11436     | 0.51        | 1/15586 (0.0%) |

There are no bond length outliers.

All (1) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms  | Z    | Observed(°) | Ideal(°) |
|-----|-------|-----|------|--------|------|-------------|----------|
| 6   | R     | 126 | SER  | N-CA-C | 5.82 | 126.70      | 111.00   |

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   | B     | 1068  | 0        | 1055     | 74      | 0            |
| 2   | D     | 1708  | 0        | 1682     | 80      | 0            |
| 3   | E     | 1615  | 0        | 1548     | 55      | 0            |
| 4   | G     | 3546  | 0        | 3468     | 144     | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 5   | Q     | 1709  | 0        | 1639     | 69      | 0            |
| 6   | R     | 1527  | 0        | 1428     | 110     | 0            |
| 7   | A     | 60    | 0        | 52       | 0       | 0            |
| 8   | C     | 96    | 0        | 81       | 3       | 0            |
| 9   | F     | 96    | 0        | 82       | 2       | 0            |
| 10  | H     | 39    | 0        | 34       | 2       | 0            |
| 10  | J     | 39    | 0        | 34       | 3       | 0            |
| 10  | M     | 39    | 0        | 34       | 0       | 0            |
| 11  | I     | 50    | 0        | 43       | 3       | 0            |
| 12  | K     | 83    | 0        | 70       | 1       | 0            |
| 13  | L     | 72    | 0        | 61       | 3       | 0            |
| 14  | N     | 28    | 0        | 25       | 3       | 0            |
| 15  | O     | 83    | 0        | 70       | 4       | 0            |
| 16  | P     | 83    | 0        | 70       | 2       | 0            |
| 17  | S     | 72    | 0        | 61       | 1       | 0            |
| 18  | T     | 105   | 0        | 86       | 3       | 0            |
| 19  | B     | 14    | 0        | 13       | 1       | 0            |
| 19  | G     | 28    | 0        | 26       | 0       | 0            |
| All | All   | 12160 | 0        | 11662    | 508     | 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 21.

All (508) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:545:LEU:HD12 | 1:B:586:TYR:CE2  | 1.25                     | 1.61              |
| 1:B:545:LEU:HD12 | 1:B:586:TYR:CD2  | 1.42                     | 1.52              |
| 6:R:142:ASP:CG   | 6:R:175:LYS:HZ1  | 1.04                     | 1.50              |
| 1:B:545:LEU:CD1  | 1:B:586:TYR:CE2  | 1.94                     | 1.47              |
| 6:R:98:TYR:CE2   | 6:R:100:MET:HG2  | 1.54                     | 1.42              |
| 1:B:545:LEU:CD1  | 1:B:586:TYR:CD2  | 2.05                     | 1.38              |
| 5:Q:48:TRP:CE2   | 6:R:99:LYS:HG3   | 1.63                     | 1.33              |
| 1:B:550:GLN:OE1  | 1:B:579:ARG:HD2  | 1.28                     | 1.30              |
| 6:R:142:ASP:CG   | 6:R:175:LYS:NZ   | 1.89                     | 1.23              |
| 1:B:547:GLY:O    | 1:B:548:ILE:CG2  | 1.87                     | 1.22              |
| 6:R:98:TYR:HE2   | 6:R:100:MET:CG   | 1.57                     | 1.18              |
| 2:D:148:GLU:HB3  | 2:D:149:PRO:CD   | 1.76                     | 1.15              |
| 6:R:163:VAL:HG11 | 6:R:182:LEU:HD22 | 1.24                     | 1.15              |
| 1:B:536:THR:O    | 1:B:540:GLN:NE2  | 1.81                     | 1.14              |
| 1:B:547:GLY:O    | 1:B:548:ILE:HG23 | 0.98                     | 1.13              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:550:GLN:OE1  | 1:B:579:ARG:CD   | 2.00                     | 1.08              |
| 4:G:391:PHE:CE2  | 4:G:470:PRO:HG3  | 1.90                     | 1.07              |
| 2:D:148:GLU:HB3  | 2:D:149:PRO:HD3  | 1.35                     | 1.05              |
| 6:R:142:ASP:CB   | 6:R:175:LYS:NZ   | 2.20                     | 1.04              |
| 6:R:142:ASP:HA   | 6:R:175:LYS:CE   | 1.92                     | 0.97              |
| 6:R:163:VAL:HG11 | 6:R:182:LEU:CD2  | 1.93                     | 0.97              |
| 5:Q:48:TRP:NE1   | 6:R:99:LYS:HG3   | 1.79                     | 0.97              |
| 1:B:545:LEU:CD1  | 1:B:586:TYR:HE2  | 1.77                     | 0.96              |
| 6:R:142:ASP:CB   | 6:R:175:LYS:HZ1  | 1.76                     | 0.95              |
| 1:B:547:GLY:C    | 1:B:548:ILE:HG23 | 1.83                     | 0.94              |
| 1:B:545:LEU:HD11 | 1:B:586:TYR:CD2  | 2.03                     | 0.93              |
| 2:D:148:GLU:CB   | 2:D:149:PRO:CD   | 2.46                     | 0.92              |
| 5:Q:168:THR:H    | 5:Q:216:ASN:HB2  | 1.35                     | 0.91              |
| 3:E:6:GLN:HG3    | 3:E:104:GLY:H    | 1.36                     | 0.91              |
| 1:B:537:LEU:HA   | 1:B:540:GLN:NE2  | 1.87                     | 0.89              |
| 4:G:391:PHE:HE2  | 4:G:470:PRO:HG3  | 1.33                     | 0.89              |
| 4:G:391:PHE:HE2  | 4:G:470:PRO:CG   | 1.87                     | 0.88              |
| 2:D:146:PHE:HB3  | 2:D:147:PRO:HD3  | 1.58                     | 0.84              |
| 6:R:142:ASP:OD1  | 6:R:175:LYS:NZ   | 1.98                     | 0.84              |
| 4:G:236:THR:H    | 10:J:1:NAG:H81   | 1.42                     | 0.83              |
| 5:Q:91:THR:HB    | 5:Q:127:THR:HA   | 1.61                     | 0.83              |
| 1:B:545:LEU:HD11 | 1:B:586:TYR:CE2  | 2.09                     | 0.83              |
| 5:Q:48:TRP:CE2   | 6:R:99:LYS:CG    | 2.55                     | 0.83              |
| 2:D:110:THR:OG1  | 2:D:148:GLU:OE2  | 1.97                     | 0.81              |
| 1:B:548:ILE:O    | 1:B:549:VAL:HG12 | 1.81                     | 0.80              |
| 6:R:36:TRP:HB2   | 6:R:48:ILE:HG21  | 1.63                     | 0.80              |
| 4:G:298:ARG:NH2  | 4:G:439:ILE:O    | 2.14                     | 0.79              |
| 5:Q:50:GLY:HA3   | 5:Q:60:TYR:HA    | 1.63                     | 0.79              |
| 4:G:391:PHE:CE2  | 4:G:470:PRO:CG   | 2.62                     | 0.79              |
| 4:G:55:ALA:HB3   | 4:G:216:HIS:HB2  | 1.64                     | 0.79              |
| 6:R:198:GLN:HA   | 6:R:207:GLU:HB3  | 1.65                     | 0.79              |
| 2:D:116:THR:HA   | 2:D:146:PHE:HD2  | 1.48                     | 0.78              |
| 2:D:148:GLU:HB3  | 2:D:149:PRO:HD2  | 1.61                     | 0.78              |
| 5:Q:48:TRP:CZ2   | 6:R:99:LYS:HG3   | 2.19                     | 0.78              |
| 1:B:537:LEU:HA   | 1:B:540:GLN:CD   | 2.04                     | 0.77              |
| 6:R:142:ASP:CB   | 6:R:175:LYS:HZ3  | 1.94                     | 0.77              |
| 1:B:536:THR:C    | 1:B:540:GLN:HE22 | 1.89                     | 0.76              |
| 4:G:33:ASN:O     | 4:G:500:ARG:HG2  | 1.86                     | 0.76              |
| 6:R:52:SER:O     | 18:T:9:MAN:O3    | 2.03                     | 0.76              |
| 4:G:90:THR:HG22  | 4:G:240:PRO:HA   | 1.68                     | 0.76              |
| 6:R:173:ASN:C    | 6:R:174:ASN:ND2  | 2.40                     | 0.76              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 2:D:201:LYS:H     | 2:D:202:PRO:CD    | 1.99                     | 0.75              |
| 2:D:124:LEU:HB2   | 2:D:141:LEU:HB2   | 1.67                     | 0.75              |
| 4:G:270:VAL:HG12  | 4:G:289:ASN:H     | 1.49                     | 0.74              |
| 6:R:142:ASP:HB2   | 6:R:175:LYS:HZ3   | 1.52                     | 0.74              |
| 1:B:537:LEU:C     | 1:B:540:GLN:OE1   | 2.26                     | 0.74              |
| 1:B:540:GLN:OE1   | 1:B:540:GLN:N     | 2.19                     | 0.74              |
| 4:G:35:TRP:HD1    | 4:G:501:CYS:H     | 1.33                     | 0.73              |
| 6:R:98:TYR:HE2    | 6:R:100:MET:HG2   | 0.67                     | 0.73              |
| 1:B:544:LEU:HG    | 4:G:222:GLY:HA2   | 1.68                     | 0.73              |
| 4:G:129:LEU:HD23  | 4:G:159:PHE:HB3   | 1.71                     | 0.73              |
| 6:R:142:ASP:HA    | 6:R:175:LYS:HE3   | 1.71                     | 0.73              |
| 4:G:258:GLN:NE2   | 4:G:371:VAL:O     | 2.21                     | 0.72              |
| 6:R:155:ASP:HA    | 6:R:193:LYS:HG2   | 1.73                     | 0.71              |
| 1:B:545:LEU:O     | 1:B:545:LEU:HD23  | 1.89                     | 0.71              |
| 4:G:475:MET:SD    | 4:G:478:ASN:ND2   | 2.64                     | 0.70              |
| 4:G:70:ALA:HB2    | 4:G:213:ILE:HD11  | 1.73                     | 0.70              |
| 4:G:98:ASN:ND2    | 4:G:486:TYR:O     | 2.24                     | 0.70              |
| 1:B:625:ASN:OD1   | 2:D:32:TYR:OH     | 2.09                     | 0.69              |
| 2:D:37:ILE:HG22   | 2:D:47:TRP:HA     | 1.72                     | 0.69              |
| 1:B:545:LEU:CD1   | 1:B:586:TYR:HD2   | 1.95                     | 0.69              |
| 2:D:163:VAL:HG12  | 2:D:182:VAL:HG23  | 1.73                     | 0.69              |
| 1:B:540:GLN:CD    | 1:B:540:GLN:H     | 1.97                     | 0.68              |
| 1:B:548:ILE:HD11  | 1:B:550:GLN:HB3   | 1.74                     | 0.68              |
| 4:G:265:LEU:HD12  | 4:G:287:GLN:HB3   | 1.76                     | 0.68              |
| 4:G:258:GLN:HG2   | 4:G:470:PRO:HB2   | 1.75                     | 0.68              |
| 2:D:146:PHE:CB    | 2:D:147:PRO:HD3   | 2.21                     | 0.68              |
| 5:Q:48:TRP:HB2    | 6:R:101:PHE:CE1   | 2.29                     | 0.67              |
| 5:Q:112:TRP:HH2   | 16:P:6:MAN:H2     | 1.58                     | 0.67              |
| 2:D:200:HIS:HD2   | 2:D:205:THR:HB    | 1.60                     | 0.67              |
| 4:G:500:ARG:O     | 4:G:501:CYS:HB2   | 1.94                     | 0.67              |
| 1:B:550:GLN:OE1   | 1:B:579:ARG:NH1   | 2.28                     | 0.67              |
| 3:E:196:SER:HA    | 3:E:209:THR:HG23  | 1.77                     | 0.67              |
| 6:R:152:TRP:CD1   | 6:R:163:VAL:HG21  | 2.30                     | 0.66              |
| 1:B:544:LEU:C     | 1:B:544:LEU:HD23  | 2.16                     | 0.66              |
| 4:G:264:SER:O     | 4:G:287:GLN:NE2   | 2.29                     | 0.66              |
| 2:D:66:ARG:HD2    | 2:D:82(B):ASN:HB2 | 1.78                     | 0.65              |
| 2:D:72(D):PRO:HG3 | 4:G:240:PRO:HG3   | 1.78                     | 0.65              |
| 1:B:548:ILE:O     | 1:B:549:VAL:CG1   | 2.44                     | 0.65              |
| 2:D:66:ARG:NH2    | 2:D:82(B):ASN:O   | 2.29                     | 0.65              |
| 6:R:88:TYR:HA     | 6:R:104:GLY:HA3   | 1.78                     | 0.65              |
| 4:G:269:GLU:HB2   | 4:G:348:GLN:HG3   | 1.78                     | 0.65              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 6:R:142:ASP:OD1  | 6:R:175:LYS:CE   | 2.45                     | 0.65              |
| 1:B:550:GLN:HB2  | 1:B:579:ARG:HD3  | 1.78                     | 0.64              |
| 4:G:325:ASP:HA   | 6:R:54:GLN:HE22  | 1.62                     | 0.64              |
| 4:G:360:ARG:O    | 4:G:467:THR:OG1  | 2.14                     | 0.64              |
| 3:E:41:PRO:HB2   | 3:E:44:ARG:HB2   | 1.77                     | 0.64              |
| 4:G:273:ARG:NH1  | 4:G:287:GLN:OE1  | 2.31                     | 0.64              |
| 4:G:219:ALA:HB2  | 4:G:225:ILE:HG13 | 1.80                     | 0.64              |
| 6:R:142:ASP:CA   | 6:R:175:LYS:NZ   | 2.60                     | 0.63              |
| 6:R:142:ASP:HA   | 6:R:175:LYS:NZ   | 2.13                     | 0.63              |
| 6:R:163:VAL:CG1  | 6:R:182:LEU:CD2  | 2.74                     | 0.63              |
| 6:R:10:PRO:HA    | 6:R:105:THR:HA   | 1.80                     | 0.63              |
| 4:G:455:THR:HG22 | 4:G:456:ARG:H    | 1.64                     | 0.63              |
| 5:Q:166:PRO:O    | 5:Q:216:ASN:ND2  | 2.32                     | 0.63              |
| 2:D:201:LYS:H    | 2:D:202:PRO:HD3  | 1.64                     | 0.62              |
| 4:G:125:LEU:HG   | 4:G:193:LEU:HD11 | 1.82                     | 0.62              |
| 4:G:391:PHE:CD2  | 4:G:470:PRO:HD3  | 2.34                     | 0.62              |
| 4:G:454:LEU:HB3  | 4:G:468:PHE:HB3  | 1.80                     | 0.62              |
| 6:R:22:ILE:HB    | 6:R:74:LEU:HB3   | 1.81                     | 0.62              |
| 4:G:391:PHE:CD2  | 4:G:470:PRO:HG3  | 2.32                     | 0.62              |
| 6:R:90:GLN:HG2   | 6:R:101:PHE:CE1  | 2.35                     | 0.62              |
| 1:B:544:LEU:CG   | 4:G:222:GLY:HA2  | 2.30                     | 0.61              |
| 2:D:6:GLN:HE21   | 2:D:92:CYS:H     | 1.47                     | 0.61              |
| 6:R:160:LYS:O    | 6:R:163:VAL:HG22 | 1.99                     | 0.61              |
| 3:E:4:LEU:HB3    | 3:E:102:GLY:HA2  | 1.82                     | 0.61              |
| 4:G:49:GLU:HG2   | 4:G:99:ASN:HB3   | 1.82                     | 0.61              |
| 1:B:545:LEU:HD23 | 1:B:545:LEU:C    | 2.21                     | 0.61              |
| 1:B:550:GLN:HB2  | 1:B:579:ARG:CD   | 2.29                     | 0.61              |
| 6:R:196:SER:HB2  | 6:R:209:THR:HG23 | 1.80                     | 0.61              |
| 4:G:236:THR:N    | 10:J:1:NAG:H81   | 2.14                     | 0.61              |
| 6:R:93:ASP:OD1   | 6:R:94:THR:N     | 2.33                     | 0.61              |
| 6:R:153:LYS:HA   | 6:R:158:PRO:HA   | 1.83                     | 0.60              |
| 6:R:152:TRP:CD2  | 6:R:182:LEU:HD21 | 2.36                     | 0.60              |
| 6:R:153:LYS:NZ   | 6:R:196:SER:O    | 2.35                     | 0.60              |
| 5:Q:28:SER:HB2   | 18:T:7:MAN:H61   | 1.83                     | 0.60              |
| 2:D:37:ILE:HD11  | 2:D:91:PHE:HB2   | 1.84                     | 0.60              |
| 1:B:549:VAL:HG13 | 1:B:549:VAL:O    | 2.02                     | 0.60              |
| 2:D:146:PHE:CD2  | 2:D:147:PRO:HG3  | 2.37                     | 0.60              |
| 3:E:195:TYR:HB2  | 3:E:212:PRO:HD3  | 1.84                     | 0.60              |
| 5:Q:33:HIS:HA    | 5:Q:101:ILE:HG22 | 1.83                     | 0.60              |
| 3:E:31:SER:O     | 3:E:32:HIS:ND1   | 2.35                     | 0.60              |
| 4:G:39:TYR:HE2   | 4:G:497:ALA:HB3  | 1.67                     | 0.60              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 6:R:175:LYS:HG3  | 6:R:175:LYS:O    | 2.01                     | 0.60              |
| 5:Q:133:THR:OG1  | 5:Q:163:PHE:HB3  | 2.02                     | 0.59              |
| 5:Q:32:ASP:O     | 5:Q:53:HIS:NE2   | 2.34                     | 0.59              |
| 2:D:201:LYS:N    | 2:D:202:PRO:CD   | 2.64                     | 0.59              |
| 4:G:95:MET:H     | 4:G:236:THR:HG21 | 1.67                     | 0.59              |
| 2:D:37:ILE:HD13  | 3:E:40:TRP:HH2   | 1.67                     | 0.59              |
| 4:G:325:ASP:OD1  | 4:G:326:ILE:N    | 2.33                     | 0.59              |
| 4:G:350:ARG:HH22 | 4:G:397:SER:H    | 1.49                     | 0.59              |
| 5:Q:22:CYS:HB2   | 5:Q:37:TRP:HZ2   | 1.68                     | 0.58              |
| 5:Q:88:ALA:HA    | 5:Q:128:VAL:HG11 | 1.85                     | 0.58              |
| 1:B:547:GLY:O    | 1:B:548:ILE:CB   | 2.51                     | 0.58              |
| 6:R:90:GLN:HG2   | 6:R:101:PHE:CZ   | 2.39                     | 0.58              |
| 4:G:292:VAL:O    | 4:G:449:ILE:HG22 | 2.04                     | 0.58              |
| 5:Q:187:LEU:HA   | 5:Q:193:TYR:HD1  | 1.69                     | 0.58              |
| 2:D:171:GLN:OE1  | 3:E:183:SER:OG   | 2.20                     | 0.58              |
| 3:E:122:PHE:HE2  | 3:E:139:LEU:HB2  | 1.68                     | 0.58              |
| 4:G:358:ILE:HB   | 4:G:465:THR:HG22 | 1.86                     | 0.58              |
| 6:R:206:VAL:HG12 | 6:R:207:GLU:H    | 1.68                     | 0.58              |
| 2:D:5:VAL:HG13   | 2:D:23:LYS:HB2   | 1.85                     | 0.57              |
| 4:G:171:LYS:HE2  | 10:H:1:NAG:H2    | 1.85                     | 0.57              |
| 5:Q:61:ASN:ND2   | 6:R:98:TYR:HE1   | 2.01                     | 0.57              |
| 1:B:547:GLY:C    | 1:B:548:ILE:CG2  | 2.57                     | 0.57              |
| 1:B:648:GLU:HA   | 1:B:652:GLN:HB3  | 1.85                     | 0.57              |
| 4:G:359:ILE:H    | 4:G:396:ILE:CG2  | 2.18                     | 0.57              |
| 2:D:47:TRP:HB2   | 3:E:101:PHE:HE2  | 1.69                     | 0.57              |
| 4:G:74:CYS:SG    | 4:G:75:VAL:N     | 2.78                     | 0.57              |
| 5:Q:114:HIS:NE2  | 16:P:6:MAN:O3    | 2.33                     | 0.57              |
| 4:G:291:PRO:HB3  | 4:G:450:THR:HG22 | 1.85                     | 0.57              |
| 5:Q:48:TRP:CZ2   | 6:R:99:LYS:CG    | 2.86                     | 0.57              |
| 1:B:605:CYS:O    | 4:G:503:ARG:HG3  | 2.05                     | 0.57              |
| 4:G:328:GLN:HB3  | 5:Q:109:LEU:HD21 | 1.87                     | 0.57              |
| 3:E:6:GLN:HG3    | 3:E:104:GLY:N    | 2.15                     | 0.57              |
| 3:E:6:GLN:HB3    | 3:E:105:THR:HG23 | 1.87                     | 0.57              |
| 5:Q:39:ARG:HG2   | 5:Q:47:GLU:HB3   | 1.87                     | 0.57              |
| 4:G:357:THR:OG1  | 4:G:465:THR:N    | 2.37                     | 0.56              |
| 2:D:116:THR:HA   | 2:D:146:PHE:CD2  | 2.35                     | 0.56              |
| 1:B:550:GLN:CD   | 1:B:579:ARG:HD2  | 2.20                     | 0.56              |
| 4:G:82:GLN:HG2   | 4:G:246:GLN:HB2  | 1.87                     | 0.56              |
| 4:G:160:ASN:N    | 4:G:160:ASN:OD1  | 2.39                     | 0.56              |
| 4:G:476:ARG:HA   | 4:G:479:TRP:CE3  | 2.40                     | 0.56              |
| 2:D:47:TRP:HZ2   | 2:D:50:TRP:HD1   | 1.53                     | 0.56              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 3:E:110:LEU:HD23 | 3:E:111:GLY:H    | 1.69                     | 0.56              |
| 4:G:391:PHE:HE2  | 4:G:470:PRO:CB   | 2.18                     | 0.56              |
| 5:Q:181:HIS:O    | 5:Q:197:SER:OG   | 2.20                     | 0.56              |
| 6:R:142:ASP:HA   | 6:R:175:LYS:HE2  | 1.85                     | 0.56              |
| 2:D:122:PHE:HB2  | 2:D:141:LEU:HD22 | 1.86                     | 0.56              |
| 6:R:168:PRO:HA   | 6:R:178:ALA:HB2  | 1.87                     | 0.56              |
| 2:D:89:THR:HA    | 2:D:108:LEU:HA   | 1.88                     | 0.56              |
| 4:G:368:ASP:H    | 4:G:371:VAL:HG12 | 1.71                     | 0.56              |
| 3:E:48:LEU:HD12  | 3:E:49:ILE:H     | 1.70                     | 0.56              |
| 4:G:95:MET:N     | 4:G:236:THR:HG21 | 2.21                     | 0.56              |
| 2:D:197:ASN:HB2  | 2:D:208:ASP:HB3  | 1.88                     | 0.55              |
| 6:R:98:TYR:CE2   | 6:R:100:MET:CG   | 2.49                     | 0.55              |
| 5:Q:104:TYR:CZ   | 5:Q:111:GLU:HA   | 2.41                     | 0.55              |
| 6:R:5:GLU:N      | 6:R:100:MET:SD   | 2.80                     | 0.55              |
| 2:D:96:LEU:HA    | 2:D:101:TYR:HB2  | 1.88                     | 0.55              |
| 2:D:150:VAL:HG22 | 2:D:178:LEU:HD21 | 1.88                     | 0.55              |
| 4:G:173:TYR:CG   | 9:F:1:NAG:H62    | 2.42                     | 0.55              |
| 5:Q:167:VAL:HG21 | 5:Q:195:LEU:HD23 | 1.88                     | 0.55              |
| 6:R:142:ASP:HB2  | 6:R:175:LYS:NZ   | 2.11                     | 0.55              |
| 1:B:537:LEU:HA   | 1:B:540:GLN:OE1  | 2.06                     | 0.55              |
| 1:B:545:LEU:CG   | 1:B:586:TYR:CD2  | 2.87                     | 0.55              |
| 3:E:135:THR:HA   | 3:E:182:LEU:HB3  | 1.88                     | 0.55              |
| 2:D:108:LEU:HD21 | 2:D:149:PRO:HG3  | 1.89                     | 0.55              |
| 4:G:298:ARG:NH1  | 4:G:302:ASN:OD1  | 2.40                     | 0.55              |
| 4:G:101:VAL:HG21 | 4:G:480:ARG:HG2  | 1.89                     | 0.54              |
| 4:G:137:ASN:ND2  | 6:R:55:ARG:O     | 2.40                     | 0.54              |
| 10:J:3:BMA:H5    | 13:L:1:NAG:H81   | 1.90                     | 0.54              |
| 4:G:45:TRP:HB3   | 4:G:491:ILE:HD13 | 1.90                     | 0.54              |
| 4:G:317:PHE:CE2  | 4:G:319:ALA:HB2  | 2.43                     | 0.54              |
| 5:Q:62:PRO:HA    | 5:Q:65:ARG:HG3   | 1.89                     | 0.54              |
| 6:R:51:ARG:HA    | 6:R:57:SER:OG    | 2.08                     | 0.54              |
| 3:E:51:TYR:O     | 3:E:53:ASP:N     | 2.40                     | 0.54              |
| 6:R:121:LEU:HD11 | 6:R:140:ILE:HG23 | 1.89                     | 0.54              |
| 4:G:129:LEU:O    | 4:G:191:TYR:N    | 2.37                     | 0.54              |
| 5:Q:36:THR:OG1   | 5:Q:49:ILE:O     | 2.26                     | 0.54              |
| 6:R:98:TYR:CE2   | 6:R:100:MET:HA   | 2.42                     | 0.54              |
| 5:Q:168:THR:N    | 5:Q:216:ASN:HB2  | 2.15                     | 0.53              |
| 4:G:83:GLU:HA    | 4:G:245:VAL:HG12 | 1.90                     | 0.53              |
| 4:G:165:LEU:HD22 | 4:G:168:LYS:HE3  | 1.91                     | 0.53              |
| 4:G:55:ALA:HA    | 4:G:75:VAL:O     | 2.09                     | 0.53              |
| 4:G:158:SER:HB2  | 4:G:173:TYR:CD2  | 2.43                     | 0.53              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 4:G:359:ILE:HA   | 4:G:467:THR:HG23 | 1.90                     | 0.53              |
| 2:D:115:SER:O    | 2:D:146:PHE:CD2  | 2.62                     | 0.53              |
| 5:Q:81:LEU:HD23  | 5:Q:82:LYS:H     | 1.72                     | 0.53              |
| 6:R:98:TYR:CE2   | 6:R:100:MET:CA   | 2.91                     | 0.53              |
| 1:B:620:SER:OG   | 1:B:624:ASP:OD2  | 2.25                     | 0.53              |
| 3:E:189:TRP:HE1  | 3:E:212:PRO:HB2  | 1.74                     | 0.53              |
| 4:G:61:TYR:O     | 4:G:65:LYS:HB3   | 2.09                     | 0.53              |
| 2:D:110:THR:HG23 | 2:D:148:GLU:OE2  | 2.09                     | 0.53              |
| 3:E:69:SER:OG    | 3:E:72:SER:OG    | 2.27                     | 0.53              |
| 5:Q:129:SER:HB3  | 5:Q:163:PHE:HZ   | 1.74                     | 0.53              |
| 6:R:86:ASP:N     | 6:R:86:ASP:OD1   | 2.33                     | 0.52              |
| 2:D:98:ARG:HB2   | 8:C:1:NAG:H83    | 1.91                     | 0.52              |
| 5:Q:9:PRO:HD2    | 5:Q:20:LEU:CD1   | 2.40                     | 0.52              |
| 6:R:152:TRP:CE2  | 6:R:182:LEU:HD21 | 2.43                     | 0.52              |
| 4:G:101:VAL:HG11 | 4:G:480:ARG:HE   | 1.75                     | 0.52              |
| 6:R:163:VAL:HB   | 6:R:182:LEU:HD23 | 1.92                     | 0.52              |
| 2:D:119:PRO:HG3  | 2:D:145:TYR:HB2  | 1.92                     | 0.52              |
| 4:G:453:ILE:HG22 | 4:G:471:GLY:O    | 2.09                     | 0.52              |
| 1:B:545:LEU:HD11 | 1:B:586:TYR:HD2  | 1.61                     | 0.52              |
| 6:R:97:SER:O     | 6:R:98:TYR:HB3   | 2.09                     | 0.52              |
| 4:G:175:LEU:HB2  | 4:G:320:THR:OG1  | 2.10                     | 0.51              |
| 6:R:86:ASP:HA    | 6:R:106:LYS:HA   | 1.91                     | 0.51              |
| 13:L:4:MAN:H62   | 13:L:5:MAN:H3    | 1.92                     | 0.51              |
| 6:R:126:SER:O    | 6:R:126:SER:OG   | 2.22                     | 0.51              |
| 2:D:200:HIS:HB3  | 2:D:202:PRO:HD2  | 1.93                     | 0.51              |
| 5:Q:61:ASN:ND2   | 6:R:98:TYR:CE1   | 2.79                     | 0.51              |
| 2:D:110:THR:CG2  | 2:D:148:GLU:OE2  | 2.58                     | 0.51              |
| 1:B:603:ILE:HG12 | 4:G:39:TYR:HD1   | 1.76                     | 0.51              |
| 4:G:193:LEU:HB2  | 4:G:196:CYS:SG   | 2.50                     | 0.51              |
| 1:B:593:LEU:HD21 | 4:G:40:TYR:HB2   | 1.92                     | 0.51              |
| 6:R:133:LYS:HA   | 6:R:186:PRO:HG3  | 1.92                     | 0.51              |
| 4:G:96:TRP:CD1   | 4:G:275:GLU:HB2  | 2.46                     | 0.50              |
| 4:G:391:PHE:CD2  | 4:G:470:PRO:CD   | 2.93                     | 0.50              |
| 6:R:155:ASP:HB2  | 6:R:193:LYS:HE3  | 1.92                     | 0.50              |
| 5:Q:50:GLY:CA    | 5:Q:60:TYR:HA    | 2.39                     | 0.50              |
| 6:R:201:HIS:H    | 6:R:205:THR:HG21 | 1.76                     | 0.50              |
| 1:B:537:LEU:CA   | 1:B:540:GLN:OE1  | 2.58                     | 0.50              |
| 4:G:172:VAL:HG11 | 4:G:309:ILE:HG12 | 1.93                     | 0.50              |
| 5:Q:188:GLN:HA   | 6:R:164:GLU:OE1  | 2.11                     | 0.50              |
| 6:R:142:ASP:OD1  | 6:R:175:LYS:HE3  | 2.11                     | 0.50              |
| 3:E:121:LEU:HD11 | 3:E:136:LEU:HD21 | 1.93                     | 0.50              |

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| Atom-1              | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|---------------------|--------------------|--------------------------|-------------------|
| 4:G:320:THR:HG23    | 4:G:438:PRO:HG3    | 1.94                     | 0.50              |
| 1:B:548:ILE:C       | 1:B:549:VAL:HG12   | 2.31                     | 0.50              |
| 2:D:119:PRO:HG2     | 2:D:200:HIS:ND1    | 2.27                     | 0.50              |
| 4:G:129:LEU:HB3     | 4:G:157:CYS:SG     | 2.52                     | 0.50              |
| 4:G:158:SER:HB2     | 4:G:173:TYR:CG     | 2.47                     | 0.50              |
| 6:R:174:ASN:ND2     | 6:R:174:ASN:N      | 2.60                     | 0.50              |
| 3:E:30:CYS:SG       | 3:E:73:ALA:HB2     | 2.51                     | 0.50              |
| 5:Q:48:TRP:CH2      | 6:R:98:TYR:HA      | 2.47                     | 0.50              |
| 4:G:445:CYS:C       | 4:G:446:VAL:HG22   | 2.32                     | 0.49              |
| 5:Q:4:LEU:HD13      | 5:Q:24:VAL:HB      | 1.92                     | 0.49              |
| 4:G:267:GLU:HA      | 4:G:267:GLU:OE1    | 2.11                     | 0.49              |
| 5:Q:31:SER:HA       | 5:Q:54:TYR:CD1     | 2.47                     | 0.49              |
| 2:D:38:ARG:NH1      | 2:D:40:THR:OG1     | 2.45                     | 0.49              |
| 2:D:72(E):VAL:HG23  | 2:D:74:SER:HA      | 1.95                     | 0.49              |
| 2:D:93:ALA:HB3      | 2:D:100(F):PRO:HB3 | 1.94                     | 0.49              |
| 4:G:96:TRP:HZ2      | 4:G:273:ARG:HB3    | 1.77                     | 0.49              |
| 5:Q:103:ILE:HD11    | 18:T:3:BMA:H5      | 1.94                     | 0.49              |
| 6:R:152:TRP:O       | 6:R:159:VAL:N      | 2.30                     | 0.49              |
| 4:G:96:TRP:CZ2      | 4:G:273:ARG:HB3    | 2.48                     | 0.49              |
| 5:Q:172:ASN:HA      | 5:Q:212:ILE:HG13   | 1.95                     | 0.49              |
| 11:I:1:NAG:H3       | 11:I:2:NAG:H2      | 1.94                     | 0.49              |
| 6:R:163:VAL:CB      | 6:R:182:LEU:HD23   | 2.43                     | 0.49              |
| 4:G:203:GLN:HG3     | 4:G:435:TYR:HD2    | 1.77                     | 0.49              |
| 4:G:299:PRO:HB2     | 4:G:327:ARG:HB2    | 1.93                     | 0.49              |
| 4:G:361:PHE:HB3     | 4:G:391:PHE:O      | 2.13                     | 0.48              |
| 1:B:522:PHE:CD2     | 1:B:523:LEU:HG     | 2.48                     | 0.48              |
| 3:E:67:TYR:HB3      | 3:E:74:TYR:HE1     | 1.78                     | 0.48              |
| 3:E:70:TYR:HB3      | 3:E:71:TRP:CE3     | 2.48                     | 0.48              |
| 6:R:170:LYS:HE3     | 6:R:176:TYR:CZ     | 2.48                     | 0.48              |
| 2:D:100(E):LEU:HD23 | 2:D:100(E):LEU:H   | 1.79                     | 0.48              |
| 6:R:129:LEU:H       | 6:R:129:LEU:HD12   | 1.79                     | 0.48              |
| 1:B:545:LEU:HD13    | 1:B:586:TYR:CE2    | 2.30                     | 0.48              |
| 6:R:133:LYS:HD3     | 6:R:186:PRO:HD3    | 1.96                     | 0.48              |
| 2:D:108:LEU:HG      | 2:D:148:GLU:OE1    | 2.14                     | 0.48              |
| 5:Q:51:ASP:OD2      | 5:Q:52:ILE:N       | 2.47                     | 0.48              |
| 5:Q:48:TRP:CZ3      | 6:R:98:TYR:HA      | 2.48                     | 0.48              |
| 15:O:1:NAG:H62      | 15:O:2:NAG:H82     | 1.95                     | 0.48              |
| 2:D:25:SER:HA       | 2:D:75:THR:HG22    | 1.95                     | 0.48              |
| 4:G:182:VAL:HG23    | 4:G:192:ARG:NH1    | 2.29                     | 0.48              |
| 2:D:93:ALA:CB       | 2:D:100(F):PRO:HB3 | 2.44                     | 0.48              |
| 4:G:54:CYS:SG       | 4:G:55:ALA:N       | 2.87                     | 0.48              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 6:R:136:LEU:HD11 | 6:R:184:LEU:HB2  | 1.96                     | 0.48              |
| 1:B:622:ILE:HG13 | 1:B:623:TRP:CD1  | 2.49                     | 0.47              |
| 2:D:127:SER:HB2  | 3:E:123:PRO:HD3  | 1.95                     | 0.47              |
| 4:G:391:PHE:HE2  | 4:G:470:PRO:HB3  | 1.79                     | 0.47              |
| 6:R:23:THR:HA    | 6:R:72:VAL:O     | 2.14                     | 0.47              |
| 6:R:36:TRP:CD2   | 6:R:74:LEU:HD22  | 2.49                     | 0.47              |
| 1:B:520:LEU:HA   | 1:B:524:GLY:HA3  | 1.95                     | 0.47              |
| 1:B:617:ARG:NH1  | 1:B:621:GLU:OE1  | 2.48                     | 0.47              |
| 3:E:65:SER:HB2   | 3:E:76:THR:HB    | 1.96                     | 0.47              |
| 5:Q:162:TYR:CE2  | 5:Q:195:LEU:HD13 | 2.49                     | 0.47              |
| 1:B:550:GLN:O    | 1:B:551:GLN:C    | 2.52                     | 0.47              |
| 4:G:152:THR:O    | 4:G:154:LEU:N    | 2.46                     | 0.47              |
| 4:G:359:ILE:H    | 4:G:396:ILE:HG21 | 1.79                     | 0.47              |
| 5:Q:162:TYR:CE2  | 5:Q:193:TYR:HB2  | 2.49                     | 0.47              |
| 4:G:391:PHE:CE2  | 4:G:470:PRO:HD3  | 2.49                     | 0.47              |
| 6:R:153:LYS:HD3  | 6:R:198:GLN:HE22 | 1.80                     | 0.47              |
| 15:O:1:NAG:O6    | 15:O:2:NAG:N2    | 2.44                     | 0.47              |
| 2:D:199:ASN:HA   | 2:D:205:THR:HG21 | 1.96                     | 0.47              |
| 4:G:331:CYS:HB2  | 4:G:385:CYS:SG   | 2.55                     | 0.47              |
| 3:E:85:GLU:HG3   | 3:E:108:SER:HA   | 1.97                     | 0.47              |
| 6:R:128:GLU:HG3  | 6:R:135:THR:H    | 1.79                     | 0.47              |
| 5:Q:21:SER:HA    | 5:Q:79:PHE:O     | 2.15                     | 0.46              |
| 6:R:51:ARG:HH11  | 6:R:54:GLN:HA    | 1.79                     | 0.46              |
| 3:E:10:VAL:HG21  | 3:E:20:ILE:HG13  | 1.96                     | 0.46              |
| 4:G:265:LEU:HD13 | 4:G:288:PHE:O    | 2.15                     | 0.46              |
| 1:B:544:LEU:CD1  | 4:G:222:GLY:HA2  | 2.45                     | 0.46              |
| 2:D:31:PHE:HD2   | 8:C:1:NAG:HN2    | 1.62                     | 0.46              |
| 2:D:34:ILE:HD11  | 2:D:92:CYS:HB2   | 1.97                     | 0.46              |
| 6:R:38:ARG:HB3   | 6:R:87:TYR:CE1   | 2.49                     | 0.46              |
| 14:N:1:NAG:H61   | 14:N:2:NAG:O5    | 2.15                     | 0.46              |
| 2:D:102:LEU:HD23 | 2:D:102:LEU:HA   | 1.73                     | 0.46              |
| 3:E:140:ILE:HD11 | 3:E:178:ALA:HB3  | 1.97                     | 0.46              |
| 1:B:548:ILE:CD1  | 1:B:550:GLN:HB3  | 2.43                     | 0.46              |
| 3:E:91:CYS:HB3   | 3:E:101:PHE:HA   | 1.98                     | 0.46              |
| 1:B:522:PHE:CE2  | 1:B:523:LEU:HG   | 2.51                     | 0.46              |
| 2:D:35:ASN:ND2   | 2:D:100(D):TRP:O | 2.49                     | 0.46              |
| 3:E:56:ARG:HD2   | 3:E:62:PRO:HA    | 1.98                     | 0.46              |
| 4:G:163:THR:HG23 | 4:G:165:LEU:H    | 1.81                     | 0.46              |
| 1:B:544:LEU:HD23 | 1:B:544:LEU:O    | 2.15                     | 0.46              |
| 2:D:94:LYS:O     | 2:D:101:TYR:N    | 2.49                     | 0.46              |
| 2:D:155:ASN:ND2  | 2:D:208:ASP:OD2  | 2.49                     | 0.46              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 4:G:294:ILE:HG13 | 4:G:447:SER:O    | 2.15                     | 0.46              |
| 4:G:391:PHE:CE2  | 4:G:470:PRO:CD   | 2.99                     | 0.46              |
| 3:E:132:ASN:HB3  | 3:E:186:PRO:HG3  | 1.98                     | 0.46              |
| 4:G:105:HIS:CD2  | 4:G:476:ARG:HB3  | 2.51                     | 0.46              |
| 6:R:163:VAL:CG1  | 6:R:182:LEU:HD23 | 2.46                     | 0.46              |
| 2:D:8:GLY:HA2    | 2:D:107:THR:HB   | 1.98                     | 0.45              |
| 5:Q:49:ILE:HG22  | 5:Q:50:GLY:H     | 1.79                     | 0.45              |
| 5:Q:98:ARG:O     | 5:Q:117:MET:HA   | 2.16                     | 0.45              |
| 5:Q:169:VAL:HG11 | 5:Q:182:THR:OG1  | 2.16                     | 0.45              |
| 14:N:1:NAG:H4    | 14:N:2:NAG:H2    | 1.65                     | 0.45              |
| 1:B:544:LEU:HG   | 4:G:222:GLY:CA   | 2.41                     | 0.45              |
| 2:D:57:LYS:NZ    | 2:D:68:ILE:HG13  | 2.31                     | 0.45              |
| 4:G:379:GLY:O    | 4:G:439:ILE:HG13 | 2.16                     | 0.45              |
| 5:Q:186:VAL:HG22 | 5:Q:187:LEU:H    | 1.81                     | 0.45              |
| 6:R:152:TRP:CD1  | 6:R:163:VAL:CG2  | 2.98                     | 0.45              |
| 6:R:35:TYR:HB2   | 6:R:90:GLN:HB2   | 1.99                     | 0.45              |
| 17:S:3:BMA:H3    | 17:S:6:MAN:H2    | 1.81                     | 0.45              |
| 1:B:604:CYS:HB2  | 4:G:38:VAL:CG2   | 2.47                     | 0.45              |
| 1:B:604:CYS:HB2  | 4:G:38:VAL:HG22  | 1.98                     | 0.45              |
| 1:B:622:ILE:HG13 | 1:B:623:TRP:HD1  | 1.81                     | 0.45              |
| 4:G:182:VAL:HG21 | 11:I:1:NAG:H82   | 1.98                     | 0.45              |
| 6:R:62:ARG:H     | 6:R:62:ARG:HG2   | 1.48                     | 0.45              |
| 6:R:98:TYR:CZ    | 6:R:100:MET:HA   | 2.52                     | 0.45              |
| 2:D:146:PHE:O    | 2:D:146:PHE:CD1  | 2.70                     | 0.45              |
| 5:Q:10:GLY:HA2   | 5:Q:126:VAL:HG22 | 1.99                     | 0.45              |
| 5:Q:50:GLY:HA3   | 5:Q:59:THR:O     | 2.17                     | 0.45              |
| 5:Q:101:ILE:HD11 | 5:Q:112:TRP:O    | 2.16                     | 0.45              |
| 1:B:545:LEU:C    | 1:B:545:LEU:CD2  | 2.86                     | 0.45              |
| 1:B:604:CYS:O    | 4:G:37:THR:HG23  | 2.16                     | 0.45              |
| 2:D:47:TRP:CZ2   | 3:E:98:GLY:HA3   | 2.51                     | 0.45              |
| 3:E:30:CYS:SG    | 3:E:68:LYS:HG3   | 2.57                     | 0.45              |
| 4:G:127:VAL:HG23 | 4:G:159:PHE:HB2  | 1.99                     | 0.45              |
| 5:Q:8:GLY:HA3    | 5:Q:20:LEU:HD12  | 1.99                     | 0.45              |
| 6:R:153:LYS:HG2  | 6:R:158:PRO:HA   | 1.97                     | 0.45              |
| 6:R:171:GLN:O    | 6:R:175:LYS:HG2  | 2.16                     | 0.45              |
| 1:B:596:TRP:HE1  | 1:B:647:GLU:HG3  | 1.82                     | 0.44              |
| 2:D:201:LYS:H    | 2:D:202:PRO:HD2  | 1.81                     | 0.44              |
| 3:E:20:ILE:O     | 3:E:74:TYR:HA    | 2.17                     | 0.44              |
| 5:Q:163:PHE:N    | 5:Q:164:PRO:CD   | 2.80                     | 0.44              |
| 6:R:37:TYR:H     | 6:R:48:ILE:HB    | 1.82                     | 0.44              |
| 5:Q:48:TRP:HB2   | 6:R:101:PHE:CD1  | 2.51                     | 0.44              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 3:E:121:LEU:HD21 | 3:E:136:LEU:HD21 | 1.98                     | 0.44              |
| 4:G:349:LEU:O    | 4:G:353:PHE:N    | 2.50                     | 0.44              |
| 4:G:350:ARG:HG3  | 4:G:355:ASN:HA   | 1.99                     | 0.44              |
| 6:R:173:ASN:OD1  | 6:R:173:ASN:N    | 2.51                     | 0.44              |
| 1:B:537:LEU:HA   | 1:B:540:GLN:HE22 | 1.65                     | 0.44              |
| 2:D:3:GLN:N      | 2:D:3:GLN:OE1    | 2.50                     | 0.44              |
| 5:Q:64:LEU:O     | 5:Q:68:VAL:HG22  | 2.18                     | 0.44              |
| 6:R:152:TRP:CE3  | 6:R:182:LEU:HD11 | 2.53                     | 0.44              |
| 4:G:36:VAL:HA    | 4:G:498:PRO:HA   | 2.00                     | 0.44              |
| 5:Q:139:PHE:CZ   | 6:R:128:GLU:HB3  | 2.53                     | 0.44              |
| 1:B:586:TYR:HE1  | 4:G:40:TYR:HH    | 1.64                     | 0.44              |
| 3:E:8:ALA:N      | 3:E:105:THR:HG22 | 2.32                     | 0.44              |
| 4:G:260:LEU:HD12 | 4:G:451:GLY:HA3  | 1.99                     | 0.44              |
| 5:Q:101:ILE:HD12 | 5:Q:114:HIS:HA   | 1.98                     | 0.44              |
| 6:R:128:GLU:HB2  | 6:R:133:LYS:O    | 2.17                     | 0.44              |
| 9:F:4:MAN:H2     | 9:F:5:NAG:H2     | 1.58                     | 0.44              |
| 3:E:114:LYS:HA   | 3:E:144:TYR:HD2  | 1.83                     | 0.44              |
| 4:G:366:GLY:O    | 4:G:372:THR:HG21 | 2.18                     | 0.44              |
| 4:G:494:LEU:HD23 | 4:G:494:LEU:HA   | 1.82                     | 0.44              |
| 1:B:544:LEU:C    | 1:B:544:LEU:CD2  | 2.86                     | 0.44              |
| 4:G:265:LEU:CD1  | 4:G:287:GLN:HB3  | 2.45                     | 0.44              |
| 5:Q:186:VAL:HG22 | 5:Q:187:LEU:HD23 | 2.00                     | 0.44              |
| 6:R:133:LYS:HE3  | 6:R:185:THR:HG22 | 1.99                     | 0.44              |
| 5:Q:34:SER:O     | 5:Q:35:TRP:HD1   | 2.00                     | 0.43              |
| 3:E:25:PRO:C     | 3:E:29:CYS:HB3   | 2.39                     | 0.43              |
| 4:G:32:GLU:HB2   | 4:G:33:ASN:H     | 1.68                     | 0.43              |
| 5:Q:47:GLU:HG3   | 5:Q:48:TRP:H     | 1.83                     | 0.43              |
| 1:B:550:GLN:OE1  | 1:B:579:ARG:HD3  | 2.06                     | 0.43              |
| 3:E:38:TYR:CE2   | 3:E:48:LEU:HD22  | 2.53                     | 0.43              |
| 4:G:257:THR:OG1  | 4:G:375:SER:OG   | 2.28                     | 0.43              |
| 1:B:548:ILE:HG21 | 4:G:221:ALA:N    | 2.33                     | 0.43              |
| 2:D:6:GLN:NE2    | 2:D:92:CYS:H     | 2.15                     | 0.43              |
| 2:D:27:TYR:CD1   | 2:D:32:TYR:HD1   | 2.37                     | 0.43              |
| 4:G:69:TRP:HA    | 4:G:111:LEU:HD21 | 2.01                     | 0.43              |
| 4:G:280:ASN:H    | 4:G:280:ASN:ND2  | 2.16                     | 0.43              |
| 4:G:477:ASP:OD1  | 4:G:480:ARG:NH1  | 2.51                     | 0.43              |
| 6:R:140:ILE:O    | 6:R:179:SER:HA   | 2.19                     | 0.43              |
| 2:D:31:PHE:CE1   | 2:D:98:ARG:HD3   | 2.53                     | 0.43              |
| 3:E:140:ILE:HG12 | 3:E:178:ALA:O    | 2.19                     | 0.43              |
| 5:Q:163:PHE:H    | 5:Q:164:PRO:CD   | 2.32                     | 0.43              |
| 5:Q:187:LEU:HA   | 5:Q:193:TYR:CD1  | 2.50                     | 0.43              |

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| Atom-1           | Atom-2           | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|------------------|--------------------------|-------------------|
| 1:B:576:LEU:HD12 | 1:B:579:ARG:HH21 | 1.84                     | 0.43              |
| 1:B:624:ASP:HB3  | 2:D:99:ASP:HB2   | 1.99                     | 0.43              |
| 2:D:33:HIS:O     | 2:D:95:GLY:N     | 2.50                     | 0.43              |
| 2:D:148:GLU:CB   | 2:D:149:PRO:HD2  | 2.29                     | 0.43              |
| 2:D:108:LEU:H    | 2:D:108:LEU:HD23 | 1.84                     | 0.43              |
| 2:D:96:LEU:HD13  | 3:E:51:TYR:CE1   | 2.54                     | 0.42              |
| 4:G:251:ILE:HG12 | 4:G:482:GLU:HG2  | 2.00                     | 0.42              |
| 4:G:350:ARG:NH2  | 4:G:397:SER:H    | 2.16                     | 0.42              |
| 4:G:425:ASN:HB3  | 4:G:433:ALA:HA   | 2.01                     | 0.42              |
| 1:B:549:VAL:O    | 1:B:549:VAL:HG22 | 2.19                     | 0.42              |
| 3:E:70:TYR:HB3   | 3:E:71:TRP:CZ3   | 2.54                     | 0.42              |
| 6:R:14:VAL:HG12  | 6:R:107:LEU:HD21 | 2.01                     | 0.42              |
| 15:O:4:MAN:H62   | 15:O:6:MAN:H2    | 1.76                     | 0.42              |
| 12:K:4:MAN:H3    | 12:K:5:MAN:H5    | 2.01                     | 0.42              |
| 4:G:265:LEU:HD23 | 4:G:267:GLU:H    | 1.85                     | 0.42              |
| 5:Q:105:GLY:HA3  | 5:Q:111:GLU:OE1  | 2.19                     | 0.42              |
| 6:R:199:VAL:O    | 6:R:205:THR:HB   | 2.20                     | 0.42              |
| 2:D:110:THR:CB   | 2:D:148:GLU:OE2  | 2.67                     | 0.42              |
| 3:E:144:TYR:CD1  | 3:E:145:PRO:HA   | 2.54                     | 0.42              |
| 4:G:280:ASN:C    | 4:G:456:ARG:HG3  | 2.40                     | 0.42              |
| 2:D:28:ARG:HG2   | 2:D:72(H):PHE:O  | 2.19                     | 0.42              |
| 3:E:81:ARG:O     | 3:E:83:GLU:N     | 2.51                     | 0.42              |
| 4:G:207:LYS:H    | 4:G:207:LYS:HG2  | 1.69                     | 0.42              |
| 2:D:11:LEU:O     | 2:D:12:LYS:HD2   | 2.19                     | 0.42              |
| 3:E:49:ILE:HG22  | 3:E:50:ILE:HG12  | 2.02                     | 0.42              |
| 4:G:457:ASP:HB2  | 4:G:467:THR:O    | 2.20                     | 0.42              |
| 3:E:51:TYR:CE2   | 3:E:57:ALA:HA    | 2.55                     | 0.42              |
| 4:G:50:THR:OG1   | 4:G:51:THR:N     | 2.53                     | 0.42              |
| 5:Q:187:LEU:H    | 5:Q:187:LEU:HD23 | 1.83                     | 0.42              |
| 6:R:164:GLU:O    | 6:R:181:TYR:O    | 2.37                     | 0.42              |
| 3:E:189:TRP:NE1  | 3:E:212:PRO:HB2  | 2.35                     | 0.42              |
| 4:G:105:HIS:HD2  | 4:G:476:ARG:HE   | 1.68                     | 0.42              |
| 4:G:424:ILE:HD12 | 4:G:424:ILE:HA   | 1.88                     | 0.42              |
| 6:R:20:ALA:HB3   | 6:R:76:ILE:HG12  | 2.00                     | 0.42              |
| 3:E:132:ASN:HB3  | 3:E:186:PRO:HB3  | 2.02                     | 0.41              |
| 5:Q:139:PHE:HZ   | 6:R:128:GLU:HB3  | 1.86                     | 0.41              |
| 4:G:86:LEU:HG    | 4:G:244:THR:HG22 | 2.03                     | 0.41              |
| 4:G:233:PHE:CE1  | 4:G:239:CYS:HB2  | 2.55                     | 0.41              |
| 6:R:125:SER:O    | 6:R:126:SER:HB3  | 2.21                     | 0.41              |
| 6:R:170:LYS:HG3  | 6:R:176:TYR:CE1  | 2.55                     | 0.41              |
| 1:B:618:ASN:OD1  | 19:B:701:NAG:N2  | 2.53                     | 0.41              |

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| Atom-1           | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|-------------------|--------------------------|-------------------|
| 4:G:172:VAL:HG21 | 4:G:309:ILE:HG21  | 2.02                     | 0.41              |
| 4:G:456:ARG:HH21 | 4:G:458:GLY:HA2   | 1.84                     | 0.41              |
| 5:Q:24:VAL:HG11  | 5:Q:35:TRP:HH2    | 1.84                     | 0.41              |
| 10:H:2:NAG:O4    | 10:H:2:NAG:O6     | 2.32                     | 0.41              |
| 11:I:1:NAG:H61   | 11:I:2:NAG:H83    | 2.02                     | 0.41              |
| 13:L:1:NAG:H62   | 13:L:2:NAG:H82    | 2.02                     | 0.41              |
| 4:G:69:TRP:O     | 4:G:111:LEU:HD21  | 2.21                     | 0.41              |
| 6:R:124:PRO:HB3  | 6:R:135:THR:O     | 2.20                     | 0.41              |
| 6:R:174:ASN:N    | 6:R:174:ASN:HD22  | 2.18                     | 0.41              |
| 4:G:42:VAL:HG12  | 4:G:493:PRO:C     | 2.41                     | 0.41              |
| 4:G:136:ASN:O    | 4:G:139:THR:HG22  | 2.21                     | 0.41              |
| 4:G:207:LYS:HE2  | 4:G:207:LYS:HB3   | 1.96                     | 0.41              |
| 5:Q:35:TRP:HE3   | 5:Q:79:PHE:CE2    | 2.38                     | 0.41              |
| 6:R:121:LEU:HG   | 6:R:197:CYS:SG    | 2.61                     | 0.41              |
| 1:B:537:LEU:HD21 | 1:B:603:ILE:HD11  | 2.02                     | 0.41              |
| 2:D:49:GLY:HA3   | 2:D:59:LEU:HG     | 2.02                     | 0.41              |
| 4:G:359:ILE:HG23 | 4:G:467:THR:HG21  | 2.02                     | 0.41              |
| 4:G:348:GLN:O    | 4:G:352:HIS:ND1   | 2.54                     | 0.41              |
| 4:G:158:SER:OG   | 4:G:159:PHE:N     | 2.54                     | 0.41              |
| 5:Q:95:TYR:OH    | 6:R:39:GLN:NE2    | 2.53                     | 0.41              |
| 2:D:51:ILE:HD11  | 2:D:69:MET:HG3    | 2.03                     | 0.41              |
| 2:D:200:HIS:HB2  | 2:D:203:SER:O     | 2.21                     | 0.41              |
| 3:E:117:PRO:HG3  | 3:E:143:PHE:HB3   | 2.03                     | 0.41              |
| 3:E:142:ASP:OD1  | 3:E:175:LYS:HG3   | 2.21                     | 0.41              |
| 4:G:233:PHE:HE2  | 4:G:236:THR:HG22  | 1.86                     | 0.41              |
| 2:D:47:TRP:HB2   | 3:E:101:PHE:CE2   | 2.53                     | 0.41              |
| 4:G:499:THR:O    | 4:G:500:ARG:C     | 2.55                     | 0.41              |
| 2:D:4:LEU:HD11   | 2:D:22:CYS:HB3    | 2.03                     | 0.40              |
| 2:D:29:PHE:HB3   | 2:D:72(B):GLU:OE1 | 2.21                     | 0.40              |
| 3:E:154:ALA:HB2  | 3:E:195:TYR:CZ    | 2.56                     | 0.40              |
| 4:G:288:PHE:CZ   | 4:G:452:LEU:HG    | 2.56                     | 0.40              |
| 6:R:206:VAL:HG12 | 6:R:207:GLU:N     | 2.35                     | 0.40              |
| 3:E:95:HIS:NE2   | 8:C:5:NAG:O6      | 2.48                     | 0.40              |
| 15:O:4:MAN:O4    | 15:O:6:MAN:H3     | 2.21                     | 0.40              |
| 2:D:154:TRP:HE1  | 2:D:158:ALA:H     | 1.69                     | 0.40              |
| 3:E:138:CYS:O    | 3:E:179:SER:OG    | 2.27                     | 0.40              |
| 5:Q:184:PRO:HA   | 5:Q:195:LEU:HG    | 2.04                     | 0.40              |
| 1:B:575:GLN:O    | 1:B:579:ARG:HG3   | 2.22                     | 0.40              |
| 3:E:6:GLN:HB3    | 3:E:105:THR:CG2   | 2.50                     | 0.40              |
| 3:E:119:VAL:HG22 | 3:E:140:ILE:HG22  | 2.03                     | 0.40              |
| 6:R:143:PHE:CE2  | 6:R:176:TYR:HB2   | 2.56                     | 0.40              |

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| Atom-1        | Atom-2        | Interatomic distance (Å) | Clash overlap (Å) |
|---------------|---------------|--------------------------|-------------------|
| 14:N:1:NAG:O3 | 14:N:2:NAG:N2 | 2.54                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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

| Mol | Chain | Analysed        | Favoured   | Allowed   | Outliers | Percentiles |    |
|-----|-------|-----------------|------------|-----------|----------|-------------|----|
| 1   | B     | 130/153 (85%)   | 118 (91%)  | 11 (8%)   | 1 (1%)   | 19          | 57 |
| 2   | D     | 222/243 (91%)   | 192 (86%)  | 26 (12%)  | 4 (2%)   | 8           | 42 |
| 3   | E     | 211/216 (98%)   | 182 (86%)  | 26 (12%)  | 3 (1%)   | 11          | 46 |
| 4   | G     | 444/479 (93%)   | 377 (85%)  | 62 (14%)  | 5 (1%)   | 14          | 51 |
| 5   | Q     | 229/241 (95%)   | 194 (85%)  | 34 (15%)  | 1 (0%)   | 34          | 70 |
| 6   | R     | 209/215 (97%)   | 156 (75%)  | 46 (22%)  | 7 (3%)   | 4           | 32 |
| All | All   | 1445/1547 (93%) | 1219 (84%) | 205 (14%) | 21 (2%)  | 10          | 46 |

All (21) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | B     | 548 | ILE  |
| 2   | D     | 147 | PRO  |
| 3   | E     | 52  | GLU  |
| 4   | G     | 61  | TYR  |
| 2   | D     | 148 | GLU  |
| 4   | G     | 501 | CYS  |
| 3   | E     | 193 | ARG  |
| 4   | G     | 364 | SER  |
| 4   | G     | 465 | THR  |
| 6   | R     | 10  | PRO  |
| 6   | R     | 98  | TYR  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 6   | R     | 127 | GLU  |
| 5   | Q     | 216 | ASN  |
| 6   | R     | 88  | TYR  |
| 2   | D     | 149 | PRO  |
| 2   | D     | 201 | LYS  |
| 3   | E     | 71  | TRP  |
| 4   | G     | 356 | ASN  |
| 6   | R     | 53  | SER  |
| 6   | R     | 195 | TYR  |
| 6   | R     | 212 | PRO  |

### 5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

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

| Mol | Chain | Analysed        | Rotameric  | Outliers | Percentiles |
|-----|-------|-----------------|------------|----------|-------------|
| 1   | B     | 116/129 (90%)   | 112 (97%)  | 4 (3%)   | 37 64       |
| 2   | D     | 190/206 (92%)   | 184 (97%)  | 6 (3%)   | 39 65       |
| 3   | E     | 186/189 (98%)   | 180 (97%)  | 6 (3%)   | 39 65       |
| 4   | G     | 401/427 (94%)   | 389 (97%)  | 12 (3%)  | 41 66       |
| 5   | Q     | 187/208 (90%)   | 176 (94%)  | 11 (6%)  | 19 51       |
| 6   | R     | 163/182 (90%)   | 157 (96%)  | 6 (4%)   | 34 62       |
| All | All   | 1243/1341 (93%) | 1198 (96%) | 45 (4%)  | 35 63       |

All (45) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res    | Type |
|-----|-------|--------|------|
| 1   | B     | 542    | ARG  |
| 1   | B     | 584    | GLU  |
| 1   | B     | 618    | ASN  |
| 1   | B     | 638    | TYR  |
| 2   | D     | 59     | LEU  |
| 2   | D     | 80     | MET  |
| 2   | D     | 100(E) | LEU  |
| 2   | D     | 164    | HIS  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | D     | 166 | PHE  |
| 2   | D     | 210 | ARG  |
| 3   | E     | 48  | LEU  |
| 3   | E     | 52  | GLU  |
| 3   | E     | 74  | TYR  |
| 3   | E     | 99  | CYS  |
| 3   | E     | 110 | LEU  |
| 3   | E     | 195 | TYR  |
| 4   | G     | 32  | GLU  |
| 4   | G     | 54  | CYS  |
| 4   | G     | 74  | CYS  |
| 4   | G     | 105 | HIS  |
| 4   | G     | 131 | CYS  |
| 4   | G     | 160 | ASN  |
| 4   | G     | 217 | TYR  |
| 4   | G     | 234 | ASN  |
| 4   | G     | 298 | ARG  |
| 4   | G     | 350 | ARG  |
| 4   | G     | 353 | PHE  |
| 4   | G     | 378 | CYS  |
| 5   | Q     | 37  | TRP  |
| 5   | Q     | 60  | TYR  |
| 5   | Q     | 79  | PHE  |
| 5   | Q     | 81  | LEU  |
| 5   | Q     | 106 | VAL  |
| 5   | Q     | 117 | MET  |
| 5   | Q     | 139 | PHE  |
| 5   | Q     | 157 | CYS  |
| 5   | Q     | 181 | HIS  |
| 5   | Q     | 187 | LEU  |
| 5   | Q     | 193 | TYR  |
| 6   | R     | 86  | ASP  |
| 6   | R     | 89  | CYS  |
| 6   | R     | 174 | ASN  |
| 6   | R     | 186 | PRO  |
| 6   | R     | 190 | LYS  |
| 6   | R     | 195 | TYR  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | B     | 551 | GLN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | B     | 552 | GLN  |
| 2   | D     | 200 | HIS  |
| 6   | R     | 174 | ASN  |

### 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](#)

78 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 |
| 7   | NAG  | A     | 1   | 1,7  | 14,14,15     | 0.37 | 0        | 17,19,21    | 0.64 | 0        |
| 7   | NAG  | A     | 2   | 7    | 14,14,15     | 0.41 | 0        | 17,19,21    | 0.78 | 0        |
| 7   | BMA  | A     | 3   | 7    | 11,11,12     | 0.34 | 0        | 15,15,17    | 1.00 | 2 (13%)  |
| 7   | MAN  | A     | 4   | 7    | 11,11,12     | 0.28 | 0        | 15,15,17    | 0.91 | 1 (6%)   |
| 7   | FUC  | A     | 5   | 7    | 10,10,11     | 0.75 | 0        | 14,14,16    | 0.87 | 0        |
| 8   | NAG  | C     | 1   | 4,8  | 14,14,15     | 0.33 | 0        | 17,19,21    | 1.63 | 4 (23%)  |
| 8   | NAG  | C     | 2   | 8    | 14,14,15     | 0.30 | 0        | 17,19,21    | 1.22 | 2 (11%)  |
| 8   | BMA  | C     | 3   | 8    | 11,11,12     | 0.46 | 0        | 15,15,17    | 1.75 | 4 (26%)  |
| 8   | MAN  | C     | 4   | 2,8  | 11,11,12     | 0.68 | 0        | 15,15,17    | 2.08 | 4 (26%)  |
| 8   | NAG  | C     | 5   | 8    | 14,14,15     | 0.38 | 0        | 17,19,21    | 1.31 | 1 (5%)   |
| 8   | GAL  | C     | 6   | 8    | 11,11,12     | 0.54 | 0        | 15,15,17    | 1.04 | 1 (6%)   |
| 8   | MAN  | C     | 7   | 8    | 11,11,12     | 0.22 | 0        | 15,15,17    | 0.87 | 0        |
| 8   | FUC  | C     | 8   | 8    | 10,10,11     | 1.06 | 1 (10%)  | 14,14,16    | 1.22 | 3 (21%)  |

| Mol | Type | Chain | Res | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|-----|------|--------------|------|----------|-------------|------|----------|
|     |      |       |     |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 9   | NAG  | F     | 1   | 9,4  | 14,14,15     | 0.30 | 0        | 17,19,21    | 0.67 | 0        |
| 9   | NAG  | F     | 2   | 9    | 14,14,15     | 0.35 | 0        | 17,19,21    | 0.95 | 1 (5%)   |
| 9   | BMA  | F     | 3   | 9    | 11,11,12     | 0.41 | 0        | 15,15,17    | 1.63 | 2 (13%)  |
| 9   | MAN  | F     | 4   | 9    | 11,11,12     | 0.58 | 0        | 15,15,17    | 1.16 | 1 (6%)   |
| 9   | NAG  | F     | 5   | 9    | 14,14,15     | 0.32 | 0        | 17,19,21    | 0.63 | 0        |
| 9   | MAN  | F     | 6   | 9    | 11,11,12     | 0.30 | 0        | 15,15,17    | 0.89 | 1 (6%)   |
| 9   | MAN  | F     | 7   | 9    | 11,11,12     | 0.28 | 0        | 15,15,17    | 0.86 | 1 (6%)   |
| 9   | FUC  | F     | 8   | 9    | 10,10,11     | 0.97 | 0        | 14,14,16    | 1.10 | 2 (14%)  |
| 10  | NAG  | H     | 1   | 10,4 | 14,14,15     | 0.40 | 0        | 17,19,21    | 0.90 | 0        |
| 10  | NAG  | H     | 2   | 10   | 14,14,15     | 0.43 | 0        | 17,19,21    | 1.16 | 3 (17%)  |
| 10  | BMA  | H     | 3   | 10   | 11,11,12     | 0.26 | 0        | 15,15,17    | 0.80 | 0        |
| 11  | NAG  | I     | 1   | 4,11 | 14,14,15     | 0.52 | 0        | 17,19,21    | 1.12 | 2 (11%)  |
| 11  | NAG  | I     | 2   | 11   | 14,14,15     | 0.65 | 0        | 17,19,21    | 0.74 | 0        |
| 11  | BMA  | I     | 3   | 11   | 11,11,12     | 0.30 | 0        | 15,15,17    | 0.80 | 1 (6%)   |
| 11  | MAN  | I     | 4   | 11   | 11,11,12     | 0.27 | 0        | 15,15,17    | 0.84 | 1 (6%)   |
| 10  | NAG  | J     | 1   | 10,4 | 14,14,15     | 0.28 | 0        | 17,19,21    | 0.84 | 1 (5%)   |
| 10  | NAG  | J     | 2   | 10   | 14,14,15     | 0.35 | 0        | 17,19,21    | 0.94 | 1 (5%)   |
| 10  | BMA  | J     | 3   | 10   | 11,11,12     | 0.28 | 0        | 15,15,17    | 0.82 | 0        |
| 12  | NAG  | K     | 1   | 12,4 | 14,14,15     | 0.29 | 0        | 17,19,21    | 1.14 | 1 (5%)   |
| 12  | NAG  | K     | 2   | 12   | 14,14,15     | 0.57 | 0        | 17,19,21    | 1.29 | 2 (11%)  |
| 12  | BMA  | K     | 3   | 12   | 11,11,12     | 0.36 | 0        | 15,15,17    | 1.39 | 4 (26%)  |
| 12  | MAN  | K     | 4   | 12   | 11,11,12     | 0.38 | 0        | 15,15,17    | 0.93 | 1 (6%)   |
| 12  | MAN  | K     | 5   | 12   | 11,11,12     | 0.92 | 2 (18%)  | 15,15,17    | 1.99 | 3 (20%)  |
| 12  | MAN  | K     | 6   | 12   | 11,11,12     | 0.27 | 0        | 15,15,17    | 0.85 | 1 (6%)   |
| 12  | MAN  | K     | 7   | 12   | 11,11,12     | 0.23 | 0        | 15,15,17    | 0.93 | 2 (13%)  |
| 13  | NAG  | L     | 1   | 13,4 | 14,14,15     | 0.37 | 0        | 17,19,21    | 1.32 | 1 (5%)   |
| 13  | NAG  | L     | 2   | 13   | 14,14,15     | 0.36 | 0        | 17,19,21    | 0.92 | 1 (5%)   |
| 13  | BMA  | L     | 3   | 13   | 11,11,12     | 0.23 | 0        | 15,15,17    | 0.85 | 0        |
| 13  | MAN  | L     | 4   | 13   | 11,11,12     | 0.27 | 0        | 15,15,17    | 0.77 | 0        |
| 13  | MAN  | L     | 5   | 13   | 11,11,12     | 0.92 | 1 (9%)   | 15,15,17    | 1.94 | 3 (20%)  |
| 13  | MAN  | L     | 6   | 13   | 11,11,12     | 0.25 | 0        | 15,15,17    | 0.84 | 0        |
| 10  | NAG  | M     | 1   | 10,4 | 14,14,15     | 0.25 | 0        | 17,19,21    | 0.72 | 0        |
| 10  | NAG  | M     | 2   | 10   | 14,14,15     | 0.46 | 0        | 17,19,21    | 1.18 | 1 (5%)   |
| 10  | BMA  | M     | 3   | 10   | 11,11,12     | 0.58 | 0        | 15,15,17    | 1.13 | 1 (6%)   |
| 14  | NAG  | N     | 1   | 14,4 | 14,14,15     | 0.34 | 0        | 17,19,21    | 1.16 | 1 (5%)   |
| 14  | NAG  | N     | 2   | 14,4 | 14,14,15     | 0.49 | 0        | 17,19,21    | 0.75 | 0        |
| 15  | NAG  | O     | 1   | 15,4 | 14,14,15     | 0.34 | 0        | 17,19,21    | 0.45 | 0        |

| Mol | Type | Chain | Res | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|-----|------|--------------|------|----------|-------------|------|----------|
|     |      |       |     |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 15  | NAG  | O     | 2   | 15   | 14,14,15     | 0.35 | 0        | 17,19,21    | 1.01 | 2 (11%)  |
| 15  | BMA  | O     | 3   | 15   | 11,11,12     | 0.70 | 0        | 15,15,17    | 1.65 | 4 (26%)  |
| 15  | MAN  | O     | 4   | 15   | 11,11,12     | 0.71 | 0        | 15,15,17    | 2.59 | 8 (53%)  |
| 15  | MAN  | O     | 5   | 15   | 11,11,12     | 0.34 | 0        | 15,15,17    | 1.01 | 2 (13%)  |
| 15  | MAN  | O     | 6   | 15   | 11,11,12     | 0.50 | 0        | 15,15,17    | 1.43 | 3 (20%)  |
| 15  | MAN  | O     | 7   | 15   | 11,11,12     | 0.26 | 0        | 15,15,17    | 0.94 | 1 (6%)   |
| 16  | NAG  | P     | 1   | 16,4 | 14,14,15     | 0.38 | 0        | 17,19,21    | 0.76 | 0        |
| 16  | NAG  | P     | 2   | 16   | 14,14,15     | 0.45 | 0        | 17,19,21    | 1.44 | 3 (17%)  |
| 16  | BMA  | P     | 3   | 16   | 11,11,12     | 0.50 | 0        | 15,15,17    | 1.98 | 4 (26%)  |
| 16  | MAN  | P     | 4   | 16   | 11,11,12     | 0.29 | 0        | 15,15,17    | 1.03 | 0        |
| 16  | MAN  | P     | 5   | 16   | 11,11,12     | 0.27 | 0        | 15,15,17    | 0.64 | 0        |
| 16  | MAN  | P     | 6   | 16   | 11,11,12     | 0.19 | 0        | 15,15,17    | 0.91 | 1 (6%)   |
| 16  | MAN  | P     | 7   | 16   | 11,11,12     | 0.24 | 0        | 15,15,17    | 0.84 | 0        |
| 17  | NAG  | S     | 1   | 17,4 | 14,14,15     | 0.35 | 0        | 17,19,21    | 1.17 | 2 (11%)  |
| 17  | NAG  | S     | 2   | 17   | 14,14,15     | 0.49 | 0        | 17,19,21    | 0.76 | 0        |
| 17  | BMA  | S     | 3   | 17   | 11,11,12     | 0.33 | 0        | 15,15,17    | 1.44 | 3 (20%)  |
| 17  | MAN  | S     | 4   | 17   | 11,11,12     | 0.25 | 0        | 15,15,17    | 1.04 | 1 (6%)   |
| 17  | MAN  | S     | 5   | 17   | 11,11,12     | 0.26 | 0        | 15,15,17    | 0.72 | 0        |
| 17  | MAN  | S     | 6   | 17   | 11,11,12     | 0.28 | 0        | 15,15,17    | 0.83 | 1 (6%)   |
| 18  | NAG  | T     | 1   | 18,4 | 14,14,15     | 0.30 | 0        | 17,19,21    | 1.79 | 3 (17%)  |
| 18  | NAG  | T     | 2   | 5,18 | 14,14,15     | 0.85 | 1 (7%)   | 17,19,21    | 1.71 | 4 (23%)  |
| 18  | BMA  | T     | 3   | 18   | 11,11,12     | 0.30 | 0        | 15,15,17    | 0.93 | 1 (6%)   |
| 18  | MAN  | T     | 4   | 18   | 11,11,12     | 0.32 | 0        | 15,15,17    | 0.74 | 0        |
| 18  | MAN  | T     | 5   | 18   | 11,11,12     | 0.45 | 0        | 15,15,17    | 1.31 | 3 (20%)  |
| 18  | MAN  | T     | 6   | 18   | 11,11,12     | 0.26 | 0        | 15,15,17    | 0.85 | 0        |
| 18  | MAN  | T     | 7   | 18   | 11,11,12     | 0.34 | 0        | 15,15,17    | 0.97 | 1 (6%)   |
| 18  | MAN  | T     | 8   | 18   | 11,11,12     | 0.72 | 0        | 15,15,17    | 1.81 | 3 (20%)  |
| 18  | MAN  | T     | 9   | 18   | 11,11,12     | 0.34 | 0        | 15,15,17    | 1.08 | 1 (6%)   |

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. '2' means no outliers of that kind were identified.

| Mol | Type | Chain | Res | Link | Chirals | Torsions  | Rings   |
|-----|------|-------|-----|------|---------|-----------|---------|
| 7   | NAG  | A     | 1   | 1,7  | -       | 2/6/23/26 | 0/1/1/1 |
| 7   | NAG  | A     | 2   | 7    | -       | 4/6/23/26 | 0/1/1/1 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions  | Rings   |
|-----|------|-------|-----|------|---------|-----------|---------|
| 7   | BMA  | A     | 3   | 7    | -       | 0/2/19/22 | 0/1/1/1 |
| 7   | MAN  | A     | 4   | 7    | -       | 0/2/19/22 | 0/1/1/1 |
| 7   | FUC  | A     | 5   | 7    | -       | -         | 0/1/1/1 |
| 8   | NAG  | C     | 1   | 4,8  | -       | 6/6/23/26 | 0/1/1/1 |
| 8   | NAG  | C     | 2   | 8    | -       | 3/6/23/26 | 0/1/1/1 |
| 8   | BMA  | C     | 3   | 8    | -       | 0/2/19/22 | 0/1/1/1 |
| 8   | MAN  | C     | 4   | 2,8  | -       | 0/2/19/22 | 0/1/1/1 |
| 8   | NAG  | C     | 5   | 8    | -       | 3/6/23/26 | 0/1/1/1 |
| 8   | GAL  | C     | 6   | 8    | -       | 0/2/19/22 | 0/1/1/1 |
| 8   | MAN  | C     | 7   | 8    | -       | 0/2/19/22 | 0/1/1/1 |
| 8   | FUC  | C     | 8   | 8    | -       | -         | 0/1/1/1 |
| 9   | NAG  | F     | 1   | 9,4  | -       | 5/6/23/26 | 0/1/1/1 |
| 9   | NAG  | F     | 2   | 9    | -       | 4/6/23/26 | 0/1/1/1 |
| 9   | BMA  | F     | 3   | 9    | -       | 2/2/19/22 | 0/1/1/1 |
| 9   | MAN  | F     | 4   | 9    | -       | 0/2/19/22 | 0/1/1/1 |
| 9   | NAG  | F     | 5   | 9    | -       | 3/6/23/26 | 0/1/1/1 |
| 9   | MAN  | F     | 6   | 9    | -       | 1/2/19/22 | 0/1/1/1 |
| 9   | MAN  | F     | 7   | 9    | -       | 0/2/19/22 | 0/1/1/1 |
| 9   | FUC  | F     | 8   | 9    | -       | -         | 0/1/1/1 |
| 10  | NAG  | H     | 1   | 10,4 | -       | 3/6/23/26 | 0/1/1/1 |
| 10  | NAG  | H     | 2   | 10   | -       | 4/6/23/26 | 0/1/1/1 |
| 10  | BMA  | H     | 3   | 10   | -       | 2/2/19/22 | 0/1/1/1 |
| 11  | NAG  | I     | 1   | 4,11 | -       | 3/6/23/26 | 0/1/1/1 |
| 11  | NAG  | I     | 2   | 11   | -       | 4/6/23/26 | 0/1/1/1 |
| 11  | BMA  | I     | 3   | 11   | -       | 1/2/19/22 | 0/1/1/1 |
| 11  | MAN  | I     | 4   | 11   | -       | 0/2/19/22 | 0/1/1/1 |
| 10  | NAG  | J     | 1   | 10,4 | -       | 3/6/23/26 | 0/1/1/1 |
| 10  | NAG  | J     | 2   | 10   | -       | 4/6/23/26 | 0/1/1/1 |
| 10  | BMA  | J     | 3   | 10   | -       | 0/2/19/22 | 0/1/1/1 |
| 12  | NAG  | K     | 1   | 12,4 | -       | 5/6/23/26 | 0/1/1/1 |
| 12  | NAG  | K     | 2   | 12   | -       | 4/6/23/26 | 0/1/1/1 |
| 12  | BMA  | K     | 3   | 12   | -       | 1/2/19/22 | 0/1/1/1 |
| 12  | MAN  | K     | 4   | 12   | -       | 0/2/19/22 | 0/1/1/1 |
| 12  | MAN  | K     | 5   | 12   | -       | 0/2/19/22 | 0/1/1/1 |
| 12  | MAN  | K     | 6   | 12   | -       | 2/2/19/22 | 0/1/1/1 |
| 12  | MAN  | K     | 7   | 12   | -       | 1/2/19/22 | 0/1/1/1 |
| 13  | NAG  | L     | 1   | 13,4 | -       | 4/6/23/26 | 0/1/1/1 |
| 13  | NAG  | L     | 2   | 13   | -       | 3/6/23/26 | 0/1/1/1 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions  | Rings   |
|-----|------|-------|-----|------|---------|-----------|---------|
| 13  | BMA  | L     | 3   | 13   | -       | 2/2/19/22 | 0/1/1/1 |
| 13  | MAN  | L     | 4   | 13   | -       | 2/2/19/22 | 0/1/1/1 |
| 13  | MAN  | L     | 5   | 13   | -       | 1/2/19/22 | 0/1/1/1 |
| 13  | MAN  | L     | 6   | 13   | -       | 0/2/19/22 | 0/1/1/1 |
| 10  | NAG  | M     | 1   | 10,4 | -       | 3/6/23/26 | 0/1/1/1 |
| 10  | NAG  | M     | 2   | 10   | -       | 4/6/23/26 | 0/1/1/1 |
| 10  | BMA  | M     | 3   | 10   | -       | 0/2/19/22 | 0/1/1/1 |
| 14  | NAG  | N     | 1   | 14,4 | -       | 6/6/23/26 | 0/1/1/1 |
| 14  | NAG  | N     | 2   | 14,4 | -       | 5/6/23/26 | 0/1/1/1 |
| 15  | NAG  | O     | 1   | 15,4 | -       | 3/6/23/26 | 0/1/1/1 |
| 15  | NAG  | O     | 2   | 15   | -       | 5/6/23/26 | 0/1/1/1 |
| 15  | BMA  | O     | 3   | 15   | -       | 2/2/19/22 | 0/1/1/1 |
| 15  | MAN  | O     | 4   | 15   | -       | 2/2/19/22 | 0/1/1/1 |
| 15  | MAN  | O     | 5   | 15   | -       | 0/2/19/22 | 0/1/1/1 |
| 15  | MAN  | O     | 6   | 15   | -       | 2/2/19/22 | 0/1/1/1 |
| 15  | MAN  | O     | 7   | 15   | -       | 0/2/19/22 | 0/1/1/1 |
| 16  | NAG  | P     | 1   | 16,4 | -       | 1/6/23/26 | 0/1/1/1 |
| 16  | NAG  | P     | 2   | 16   | -       | 4/6/23/26 | 0/1/1/1 |
| 16  | BMA  | P     | 3   | 16   | -       | 0/2/19/22 | 0/1/1/1 |
| 16  | MAN  | P     | 4   | 16   | -       | 0/2/19/22 | 0/1/1/1 |
| 16  | MAN  | P     | 5   | 16   | -       | 2/2/19/22 | 0/1/1/1 |
| 16  | MAN  | P     | 6   | 16   | -       | 0/2/19/22 | 0/1/1/1 |
| 16  | MAN  | P     | 7   | 16   | -       | 0/2/19/22 | 0/1/1/1 |
| 17  | NAG  | S     | 1   | 17,4 | -       | 0/6/23/26 | 0/1/1/1 |
| 17  | NAG  | S     | 2   | 17   | -       | 3/6/23/26 | 0/1/1/1 |
| 17  | BMA  | S     | 3   | 17   | -       | 1/2/19/22 | 0/1/1/1 |
| 17  | MAN  | S     | 4   | 17   | -       | 1/2/19/22 | 0/1/1/1 |
| 17  | MAN  | S     | 5   | 17   | -       | 0/2/19/22 | 0/1/1/1 |
| 17  | MAN  | S     | 6   | 17   | -       | 1/2/19/22 | 0/1/1/1 |
| 18  | NAG  | T     | 1   | 18,4 | -       | 2/6/23/26 | 0/1/1/1 |
| 18  | NAG  | T     | 2   | 5,18 | -       | 2/6/23/26 | 0/1/1/1 |
| 18  | BMA  | T     | 3   | 18   | -       | 2/2/19/22 | 0/1/1/1 |
| 18  | MAN  | T     | 4   | 18   | -       | 2/2/19/22 | 0/1/1/1 |
| 18  | MAN  | T     | 5   | 18   | -       | 1/2/19/22 | 0/1/1/1 |
| 18  | MAN  | T     | 6   | 18   | -       | 0/2/19/22 | 0/1/1/1 |
| 18  | MAN  | T     | 7   | 18   | -       | 1/2/19/22 | 0/1/1/1 |
| 18  | MAN  | T     | 8   | 18   | -       | 2/2/19/22 | 0/1/1/1 |
| 18  | MAN  | T     | 9   | 18   | -       | 2/2/19/22 | 0/1/1/1 |

All (5) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z    | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|------|-------------|----------|
| 18  | T     | 2   | NAG  | C1-C2 | 2.47 | 1.56        | 1.52     |
| 13  | L     | 5   | MAN  | O5-C1 | 2.12 | 1.47        | 1.43     |
| 12  | K     | 5   | MAN  | O5-C1 | 2.11 | 1.47        | 1.43     |
| 8   | C     | 8   | FUC  | C1-C2 | 2.09 | 1.57        | 1.52     |
| 12  | K     | 5   | MAN  | C1-C2 | 2.02 | 1.56        | 1.52     |

All (112) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|-------|-------------|----------|
| 9   | F     | 3   | BMA  | O3-C3-C2 | -5.54 | 99.38       | 109.99   |
| 8   | C     | 4   | MAN  | O2-C2-C1 | 5.44  | 120.29      | 109.15   |
| 15  | O     | 4   | MAN  | O5-C5-C6 | 5.36  | 115.61      | 107.20   |
| 18  | T     | 1   | NAG  | O4-C4-C3 | -5.19 | 98.34       | 110.35   |
| 13  | L     | 5   | MAN  | C1-C2-C3 | 4.92  | 115.72      | 109.67   |
| 12  | K     | 5   | MAN  | C1-C2-C3 | 4.81  | 115.58      | 109.67   |
| 18  | T     | 8   | MAN  | O2-C2-C3 | 4.75  | 119.66      | 110.14   |
| 12  | K     | 5   | MAN  | O5-C1-C2 | -4.21 | 104.28      | 110.77   |
| 17  | S     | 3   | BMA  | O5-C5-C6 | 4.12  | 113.67      | 107.20   |
| 13  | L     | 5   | MAN  | O5-C1-C2 | -3.98 | 104.63      | 110.77   |
| 15  | O     | 4   | MAN  | C1-C2-C3 | 3.95  | 114.52      | 109.67   |
| 18  | T     | 1   | NAG  | O4-C4-C5 | -3.91 | 99.60       | 109.30   |
| 13  | L     | 1   | NAG  | O4-C4-C5 | -3.85 | 99.73       | 109.30   |
| 16  | P     | 3   | BMA  | O3-C3-C2 | -3.75 | 102.81      | 109.99   |
| 8   | C     | 1   | NAG  | O4-C4-C5 | -3.71 | 100.08      | 109.30   |
| 8   | C     | 4   | MAN  | O3-C3-C4 | 3.69  | 118.87      | 110.35   |
| 8   | C     | 5   | NAG  | C2-N2-C7 | 3.61  | 128.05      | 122.90   |
| 16  | P     | 3   | BMA  | O5-C1-C2 | -3.57 | 105.26      | 110.77   |
| 16  | P     | 2   | NAG  | O4-C4-C3 | 3.55  | 118.56      | 110.35   |
| 18  | T     | 2   | NAG  | O5-C1-C2 | -3.53 | 105.72      | 111.29   |
| 10  | M     | 2   | NAG  | O4-C4-C3 | 3.51  | 118.47      | 110.35   |
| 16  | P     | 3   | BMA  | O3-C3-C4 | 3.49  | 118.41      | 110.35   |
| 8   | C     | 3   | BMA  | O5-C5-C6 | 3.45  | 112.62      | 107.20   |
| 12  | K     | 2   | NAG  | O5-C1-C2 | -3.43 | 105.87      | 111.29   |
| 8   | C     | 3   | BMA  | C1-O5-C5 | -3.41 | 107.57      | 112.19   |
| 12  | K     | 5   | MAN  | C1-O5-C5 | 3.38  | 116.77      | 112.19   |
| 15  | O     | 6   | MAN  | C1-C2-C3 | 3.36  | 113.80      | 109.67   |
| 18  | T     | 2   | NAG  | O4-C4-C3 | -3.36 | 102.59      | 110.35   |
| 17  | S     | 1   | NAG  | O4-C4-C3 | -3.27 | 102.79      | 110.35   |
| 8   | C     | 1   | NAG  | O4-C4-C3 | -3.24 | 102.85      | 110.35   |
| 15  | O     | 4   | MAN  | O6-C6-C5 | -3.22 | 100.25      | 111.29   |
| 18  | T     | 2   | NAG  | O4-C4-C5 | -3.19 | 101.37      | 109.30   |
| 18  | T     | 8   | MAN  | C1-C2-C3 | -3.18 | 105.75      | 109.67   |

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| Mol | Chain | Res | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|-------|-------------|----------|
| 12  | K     | 1   | NAG  | O4-C4-C3 | -3.16 | 103.04      | 110.35   |
| 15  | O     | 3   | BMA  | O3-C3-C4 | 3.15  | 117.64      | 110.35   |
| 15  | O     | 4   | MAN  | C1-O5-C5 | -3.14 | 107.94      | 112.19   |
| 17  | S     | 4   | MAN  | O5-C1-C2 | -3.10 | 105.98      | 110.77   |
| 8   | C     | 2   | NAG  | O4-C4-C5 | -3.09 | 101.62      | 109.30   |
| 15  | O     | 4   | MAN  | O3-C3-C4 | 3.07  | 117.46      | 110.35   |
| 13  | L     | 5   | MAN  | C1-O5-C5 | 3.05  | 116.32      | 112.19   |
| 8   | C     | 2   | NAG  | O5-C1-C2 | -3.01 | 106.53      | 111.29   |
| 18  | T     | 8   | MAN  | O3-C3-C2 | 2.89  | 115.53      | 109.99   |
| 15  | O     | 6   | MAN  | O5-C1-C2 | -2.89 | 106.31      | 110.77   |
| 18  | T     | 7   | MAN  | O5-C1-C2 | -2.85 | 106.37      | 110.77   |
| 8   | C     | 4   | MAN  | C1-C2-C3 | -2.83 | 106.18      | 109.67   |
| 12  | K     | 2   | NAG  | O4-C4-C5 | -2.81 | 102.31      | 109.30   |
| 12  | K     | 3   | BMA  | O3-C3-C2 | 2.81  | 115.37      | 109.99   |
| 15  | O     | 6   | MAN  | O5-C5-C6 | 2.77  | 111.54      | 107.20   |
| 10  | M     | 3   | BMA  | O5-C1-C2 | -2.74 | 106.54      | 110.77   |
| 18  | T     | 5   | MAN  | O3-C3-C4 | 2.74  | 116.67      | 110.35   |
| 15  | O     | 4   | MAN  | C3-C4-C5 | -2.69 | 105.45      | 110.24   |
| 14  | N     | 1   | NAG  | C1-O5-C5 | 2.68  | 115.83      | 112.19   |
| 15  | O     | 3   | BMA  | O5-C1-C2 | -2.66 | 106.67      | 110.77   |
| 15  | O     | 4   | MAN  | O4-C4-C3 | 2.59  | 116.33      | 110.35   |
| 9   | F     | 8   | FUC  | O2-C2-C1 | 2.58  | 114.44      | 109.15   |
| 16  | P     | 6   | MAN  | O5-C1-C2 | -2.57 | 106.81      | 110.77   |
| 15  | O     | 2   | NAG  | O4-C4-C5 | -2.55 | 102.95      | 109.30   |
| 12  | K     | 6   | MAN  | O5-C1-C2 | -2.54 | 106.84      | 110.77   |
| 18  | T     | 2   | NAG  | C1-O5-C5 | -2.51 | 108.79      | 112.19   |
| 15  | O     | 5   | MAN  | O5-C1-C2 | -2.51 | 106.89      | 110.77   |
| 18  | T     | 9   | MAN  | O5-C5-C6 | 2.50  | 111.13      | 107.20   |
| 8   | C     | 1   | NAG  | C6-C5-C4 | -2.47 | 107.22      | 113.00   |
| 15  | O     | 4   | MAN  | O5-C1-C2 | -2.46 | 106.97      | 110.77   |
| 16  | P     | 2   | NAG  | C4-C3-C2 | -2.44 | 107.44      | 111.02   |
| 15  | O     | 3   | BMA  | O5-C5-C6 | 2.42  | 111.00      | 107.20   |
| 16  | P     | 3   | BMA  | C1-O5-C5 | -2.42 | 108.92      | 112.19   |
| 8   | C     | 8   | FUC  | C1-C2-C3 | 2.41  | 112.63      | 109.67   |
| 17  | S     | 1   | NAG  | O5-C1-C2 | -2.41 | 107.49      | 111.29   |
| 7   | A     | 3   | BMA  | O5-C1-C2 | -2.36 | 107.12      | 110.77   |
| 11  | I     | 1   | NAG  | C1-O5-C5 | -2.36 | 109.00      | 112.19   |
| 15  | O     | 2   | NAG  | O5-C1-C2 | -2.35 | 107.57      | 111.29   |
| 8   | C     | 4   | MAN  | C3-C4-C5 | -2.34 | 106.06      | 110.24   |
| 8   | C     | 3   | BMA  | O5-C1-C2 | -2.33 | 107.17      | 110.77   |
| 16  | P     | 2   | NAG  | C1-O5-C5 | 2.32  | 115.34      | 112.19   |
| 15  | O     | 7   | MAN  | O5-C1-C2 | -2.31 | 107.21      | 110.77   |

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| Mol | Chain | Res | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|-----|------|----------|-------|-------------|----------|
| 18  | T     | 3   | BMA  | C1-O5-C5 | -2.30 | 109.08      | 112.19   |
| 12  | K     | 3   | BMA  | O5-C1-C2 | -2.28 | 107.25      | 110.77   |
| 7   | A     | 4   | MAN  | O5-C1-C2 | -2.28 | 107.25      | 110.77   |
| 11  | I     | 1   | NAG  | O4-C4-C3 | 2.27  | 115.61      | 110.35   |
| 11  | I     | 3   | BMA  | O5-C1-C2 | -2.27 | 107.27      | 110.77   |
| 13  | L     | 2   | NAG  | C1-O5-C5 | 2.27  | 115.26      | 112.19   |
| 9   | F     | 2   | NAG  | O4-C4-C5 | -2.26 | 103.68      | 109.30   |
| 11  | I     | 4   | MAN  | O5-C1-C2 | -2.22 | 107.35      | 110.77   |
| 8   | C     | 8   | FUC  | O5-C5-C4 | 2.20  | 113.47      | 109.52   |
| 8   | C     | 8   | FUC  | C1-O5-C5 | 2.19  | 117.73      | 112.78   |
| 18  | T     | 5   | MAN  | O5-C1-C2 | -2.18 | 107.40      | 110.77   |
| 18  | T     | 5   | MAN  | O3-C3-C2 | -2.18 | 105.83      | 109.99   |
| 8   | C     | 6   | GAL  | C1-O5-C5 | 2.16  | 115.11      | 112.19   |
| 15  | O     | 3   | BMA  | C6-C5-C4 | 2.15  | 118.05      | 113.00   |
| 18  | T     | 1   | NAG  | O5-C1-C2 | -2.13 | 107.92      | 111.29   |
| 10  | J     | 2   | NAG  | C2-N2-C7 | 2.12  | 125.92      | 122.90   |
| 10  | J     | 1   | NAG  | C2-N2-C7 | 2.11  | 125.91      | 122.90   |
| 12  | K     | 7   | MAN  | O5-C5-C6 | 2.11  | 110.50      | 107.20   |
| 17  | S     | 6   | MAN  | O5-C1-C2 | -2.11 | 107.52      | 110.77   |
| 8   | C     | 3   | BMA  | O2-C2-C3 | -2.10 | 105.93      | 110.14   |
| 15  | O     | 5   | MAN  | O5-C5-C6 | 2.10  | 110.50      | 107.20   |
| 12  | K     | 3   | BMA  | O3-C3-C4 | -2.10 | 105.50      | 110.35   |
| 7   | A     | 3   | BMA  | O5-C5-C6 | 2.08  | 110.46      | 107.20   |
| 12  | K     | 7   | MAN  | O5-C1-C2 | -2.08 | 107.56      | 110.77   |
| 10  | H     | 2   | NAG  | O4-C4-C3 | 2.07  | 115.14      | 110.35   |
| 9   | F     | 7   | MAN  | O5-C1-C2 | -2.06 | 107.59      | 110.77   |
| 8   | C     | 1   | NAG  | C1-O5-C5 | -2.06 | 109.41      | 112.19   |
| 10  | H     | 2   | NAG  | O4-C4-C5 | -2.06 | 104.19      | 109.30   |
| 17  | S     | 3   | BMA  | O5-C1-C2 | -2.05 | 107.61      | 110.77   |
| 9   | F     | 4   | MAN  | O2-C2-C1 | 2.04  | 113.34      | 109.15   |
| 10  | H     | 2   | NAG  | O3-C3-C2 | -2.04 | 105.24      | 109.47   |
| 9   | F     | 3   | BMA  | C1-C2-C3 | 2.04  | 112.18      | 109.67   |
| 9   | F     | 6   | MAN  | O5-C1-C2 | -2.04 | 107.63      | 110.77   |
| 17  | S     | 3   | BMA  | C1-O5-C5 | -2.02 | 109.45      | 112.19   |
| 12  | K     | 4   | MAN  | O5-C1-C2 | -2.01 | 107.67      | 110.77   |
| 12  | K     | 3   | BMA  | O4-C4-C3 | -2.01 | 105.71      | 110.35   |
| 9   | F     | 8   | FUC  | O5-C5-C4 | 2.01  | 113.12      | 109.52   |

There are no chirality outliers.

All (141) torsion outliers are listed below:



| Mol | Chain | Res | Type | Atoms       |
|-----|-------|-----|------|-------------|
| 8   | C     | 1   | NAG  | C8-C7-N2-C2 |
| 8   | C     | 1   | NAG  | O7-C7-N2-C2 |
| 8   | C     | 2   | NAG  | C3-C2-N2-C7 |
| 8   | C     | 2   | NAG  | C8-C7-N2-C2 |
| 8   | C     | 2   | NAG  | O7-C7-N2-C2 |
| 8   | C     | 5   | NAG  | C8-C7-N2-C2 |
| 8   | C     | 5   | NAG  | O7-C7-N2-C2 |
| 9   | F     | 2   | NAG  | C3-C2-N2-C7 |
| 9   | F     | 2   | NAG  | C8-C7-N2-C2 |
| 9   | F     | 2   | NAG  | O7-C7-N2-C2 |
| 9   | F     | 5   | NAG  | C8-C7-N2-C2 |
| 9   | F     | 5   | NAG  | O7-C7-N2-C2 |
| 10  | H     | 1   | NAG  | C3-C2-N2-C7 |
| 10  | H     | 1   | NAG  | C8-C7-N2-C2 |
| 10  | H     | 1   | NAG  | O7-C7-N2-C2 |
| 10  | J     | 1   | NAG  | C8-C7-N2-C2 |
| 10  | J     | 1   | NAG  | O7-C7-N2-C2 |
| 10  | M     | 1   | NAG  | C3-C2-N2-C7 |
| 10  | M     | 1   | NAG  | C8-C7-N2-C2 |
| 10  | M     | 1   | NAG  | O7-C7-N2-C2 |
| 11  | I     | 1   | NAG  | C3-C2-N2-C7 |
| 11  | I     | 1   | NAG  | C8-C7-N2-C2 |
| 11  | I     | 1   | NAG  | O7-C7-N2-C2 |
| 12  | K     | 1   | NAG  | C3-C2-N2-C7 |
| 12  | K     | 1   | NAG  | C8-C7-N2-C2 |
| 12  | K     | 1   | NAG  | O7-C7-N2-C2 |
| 12  | K     | 2   | NAG  | C8-C7-N2-C2 |
| 12  | K     | 2   | NAG  | O7-C7-N2-C2 |
| 13  | L     | 1   | NAG  | C3-C2-N2-C7 |
| 13  | L     | 1   | NAG  | C8-C7-N2-C2 |
| 13  | L     | 1   | NAG  | O7-C7-N2-C2 |
| 14  | N     | 1   | NAG  | C8-C7-N2-C2 |
| 14  | N     | 1   | NAG  | O7-C7-N2-C2 |
| 15  | O     | 2   | NAG  | C3-C2-N2-C7 |
| 15  | O     | 2   | NAG  | C8-C7-N2-C2 |
| 15  | O     | 2   | NAG  | O7-C7-N2-C2 |
| 16  | P     | 2   | NAG  | C8-C7-N2-C2 |
| 16  | P     | 2   | NAG  | O7-C7-N2-C2 |
| 17  | S     | 2   | NAG  | C3-C2-N2-C7 |
| 17  | S     | 2   | NAG  | C8-C7-N2-C2 |
| 17  | S     | 2   | NAG  | O7-C7-N2-C2 |
| 15  | O     | 3   | BMA  | C4-C5-C6-O6 |
| 9   | F     | 1   | NAG  | C8-C7-N2-C2 |

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| Mol | Chain | Res | Type | Atoms       |
|-----|-------|-----|------|-------------|
| 9   | F     | 1   | NAG  | O7-C7-N2-C2 |
| 18  | T     | 9   | MAN  | C4-C5-C6-O6 |
| 14  | N     | 1   | NAG  | O5-C5-C6-O6 |
| 7   | A     | 2   | NAG  | C8-C7-N2-C2 |
| 14  | N     | 2   | NAG  | C8-C7-N2-C2 |
| 16  | P     | 5   | MAN  | O5-C5-C6-O6 |
| 14  | N     | 1   | NAG  | C4-C5-C6-O6 |
| 13  | L     | 3   | BMA  | O5-C5-C6-O6 |
| 15  | O     | 3   | BMA  | O5-C5-C6-O6 |
| 7   | A     | 2   | NAG  | O7-C7-N2-C2 |
| 14  | N     | 2   | NAG  | O7-C7-N2-C2 |
| 15  | O     | 1   | NAG  | C8-C7-N2-C2 |
| 18  | T     | 1   | NAG  | C8-C7-N2-C2 |
| 15  | O     | 4   | MAN  | C4-C5-C6-O6 |
| 7   | A     | 2   | NAG  | C1-C2-N2-C7 |
| 8   | C     | 5   | NAG  | C1-C2-N2-C7 |
| 14  | N     | 1   | NAG  | C1-C2-N2-C7 |
| 16  | P     | 2   | NAG  | C1-C2-N2-C7 |
| 18  | T     | 2   | NAG  | C1-C2-N2-C7 |
| 7   | A     | 1   | NAG  | O5-C5-C6-O6 |
| 7   | A     | 1   | NAG  | C4-C5-C6-O6 |
| 15  | O     | 1   | NAG  | O7-C7-N2-C2 |
| 18  | T     | 1   | NAG  | O7-C7-N2-C2 |
| 18  | T     | 4   | MAN  | O5-C5-C6-O6 |
| 8   | C     | 1   | NAG  | C4-C5-C6-O6 |
| 10  | J     | 1   | NAG  | C1-C2-N2-C7 |
| 12  | K     | 2   | NAG  | C1-C2-N2-C7 |
| 11  | I     | 2   | NAG  | C8-C7-N2-C2 |
| 11  | I     | 2   | NAG  | O7-C7-N2-C2 |
| 18  | T     | 3   | BMA  | O5-C5-C6-O6 |
| 11  | I     | 3   | BMA  | O5-C5-C6-O6 |
| 12  | K     | 1   | NAG  | O5-C5-C6-O6 |
| 15  | O     | 2   | NAG  | O5-C5-C6-O6 |
| 15  | O     | 2   | NAG  | C4-C5-C6-O6 |
| 18  | T     | 9   | MAN  | O5-C5-C6-O6 |
| 10  | H     | 3   | BMA  | O5-C5-C6-O6 |
| 12  | K     | 6   | MAN  | O5-C5-C6-O6 |
| 13  | L     | 4   | MAN  | O5-C5-C6-O6 |
| 10  | H     | 3   | BMA  | C4-C5-C6-O6 |
| 16  | P     | 5   | MAN  | C4-C5-C6-O6 |
| 15  | O     | 6   | MAN  | C4-C5-C6-O6 |
| 10  | M     | 2   | NAG  | C8-C7-N2-C2 |

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| Mol | Chain | Res | Type | Atoms       |
|-----|-------|-----|------|-------------|
| 14  | N     | 2   | NAG  | C1-C2-N2-C7 |
| 8   | C     | 1   | NAG  | O5-C5-C6-O6 |
| 12  | K     | 6   | MAN  | C4-C5-C6-O6 |
| 13  | L     | 1   | NAG  | O5-C5-C6-O6 |
| 9   | F     | 1   | NAG  | C1-C2-N2-C7 |
| 11  | I     | 2   | NAG  | C1-C2-N2-C7 |
| 13  | L     | 4   | MAN  | C4-C5-C6-O6 |
| 18  | T     | 4   | MAN  | C4-C5-C6-O6 |
| 10  | M     | 2   | NAG  | O7-C7-N2-C2 |
| 11  | I     | 2   | NAG  | O5-C5-C6-O6 |
| 16  | P     | 2   | NAG  | O5-C5-C6-O6 |
| 17  | S     | 3   | BMA  | O5-C5-C6-O6 |
| 13  | L     | 2   | NAG  | O5-C5-C6-O6 |
| 12  | K     | 3   | BMA  | O5-C5-C6-O6 |
| 13  | L     | 5   | MAN  | O5-C5-C6-O6 |
| 18  | T     | 5   | MAN  | O5-C5-C6-O6 |
| 15  | O     | 1   | NAG  | O5-C5-C6-O6 |
| 15  | O     | 4   | MAN  | O5-C5-C6-O6 |
| 13  | L     | 2   | NAG  | C8-C7-N2-C2 |
| 9   | F     | 2   | NAG  | O5-C5-C6-O6 |
| 10  | H     | 2   | NAG  | O5-C5-C6-O6 |
| 16  | P     | 1   | NAG  | O5-C5-C6-O6 |
| 15  | O     | 6   | MAN  | O5-C5-C6-O6 |
| 12  | K     | 2   | NAG  | O5-C5-C6-O6 |
| 17  | S     | 4   | MAN  | O5-C5-C6-O6 |
| 9   | F     | 5   | NAG  | O5-C5-C6-O6 |
| 10  | M     | 2   | NAG  | O5-C5-C6-O6 |
| 17  | S     | 6   | MAN  | O5-C5-C6-O6 |
| 13  | L     | 3   | BMA  | C4-C5-C6-O6 |
| 10  | H     | 2   | NAG  | C3-C2-N2-C7 |
| 10  | M     | 2   | NAG  | C3-C2-N2-C7 |
| 14  | N     | 1   | NAG  | C3-C2-N2-C7 |
| 13  | L     | 2   | NAG  | O7-C7-N2-C2 |
| 10  | J     | 2   | NAG  | C4-C5-C6-O6 |
| 10  | H     | 2   | NAG  | C8-C7-N2-C2 |
| 8   | C     | 1   | NAG  | C1-C2-N2-C7 |
| 18  | T     | 3   | BMA  | C4-C5-C6-O6 |
| 10  | J     | 2   | NAG  | O5-C5-C6-O6 |
| 18  | T     | 8   | MAN  | C4-C5-C6-O6 |
| 10  | H     | 2   | NAG  | O7-C7-N2-C2 |
| 9   | F     | 6   | MAN  | O5-C5-C6-O6 |
| 9   | F     | 3   | BMA  | O5-C5-C6-O6 |

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| Mol | Chain | Res | Type | Atoms       |
|-----|-------|-----|------|-------------|
| 18  | T     | 8   | MAN  | O5-C5-C6-O6 |
| 12  | K     | 7   | MAN  | C4-C5-C6-O6 |
| 7   | A     | 2   | NAG  | C3-C2-N2-C7 |
| 8   | C     | 1   | NAG  | C3-C2-N2-C7 |
| 14  | N     | 2   | NAG  | C3-C2-N2-C7 |
| 18  | T     | 7   | MAN  | O5-C5-C6-O6 |
| 9   | F     | 3   | BMA  | C4-C5-C6-O6 |
| 9   | F     | 1   | NAG  | C4-C5-C6-O6 |
| 9   | F     | 1   | NAG  | C3-C2-N2-C7 |
| 10  | J     | 2   | NAG  | C3-C2-N2-C7 |
| 18  | T     | 2   | NAG  | C3-C2-N2-C7 |
| 10  | J     | 2   | NAG  | C1-C2-N2-C7 |
| 12  | K     | 1   | NAG  | C4-C5-C6-O6 |
| 14  | N     | 2   | NAG  | C4-C5-C6-O6 |

There are no ring outliers.

29 monomers are involved in 29 short contacts:

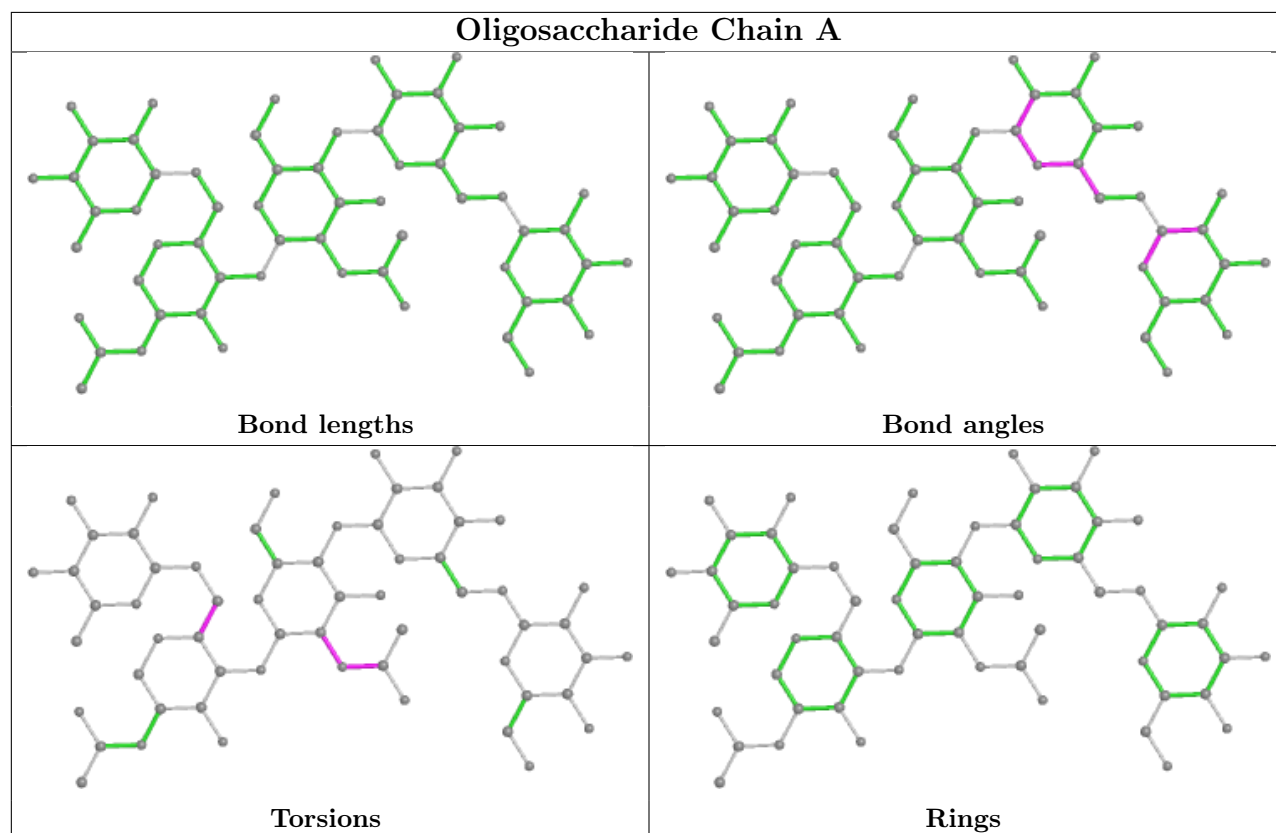
| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 12  | K     | 5   | MAN  | 1       | 0            |
| 8   | C     | 1   | NAG  | 2       | 0            |
| 13  | L     | 4   | MAN  | 1       | 0            |
| 13  | L     | 2   | NAG  | 1       | 0            |
| 9   | F     | 1   | NAG  | 1       | 0            |
| 12  | K     | 4   | MAN  | 1       | 0            |
| 10  | J     | 3   | BMA  | 1       | 0            |
| 14  | N     | 2   | NAG  | 3       | 0            |
| 10  | J     | 1   | NAG  | 2       | 0            |
| 13  | L     | 5   | MAN  | 1       | 0            |
| 15  | O     | 4   | MAN  | 2       | 0            |
| 8   | C     | 5   | NAG  | 1       | 0            |
| 18  | T     | 3   | BMA  | 1       | 0            |
| 16  | P     | 6   | MAN  | 2       | 0            |
| 17  | S     | 6   | MAN  | 1       | 0            |
| 17  | S     | 3   | BMA  | 1       | 0            |
| 15  | O     | 1   | NAG  | 2       | 0            |
| 18  | T     | 9   | MAN  | 1       | 0            |
| 15  | O     | 2   | NAG  | 2       | 0            |
| 14  | N     | 1   | NAG  | 3       | 0            |
| 10  | H     | 2   | NAG  | 1       | 0            |
| 10  | H     | 1   | NAG  | 1       | 0            |
| 9   | F     | 5   | NAG  | 1       | 0            |

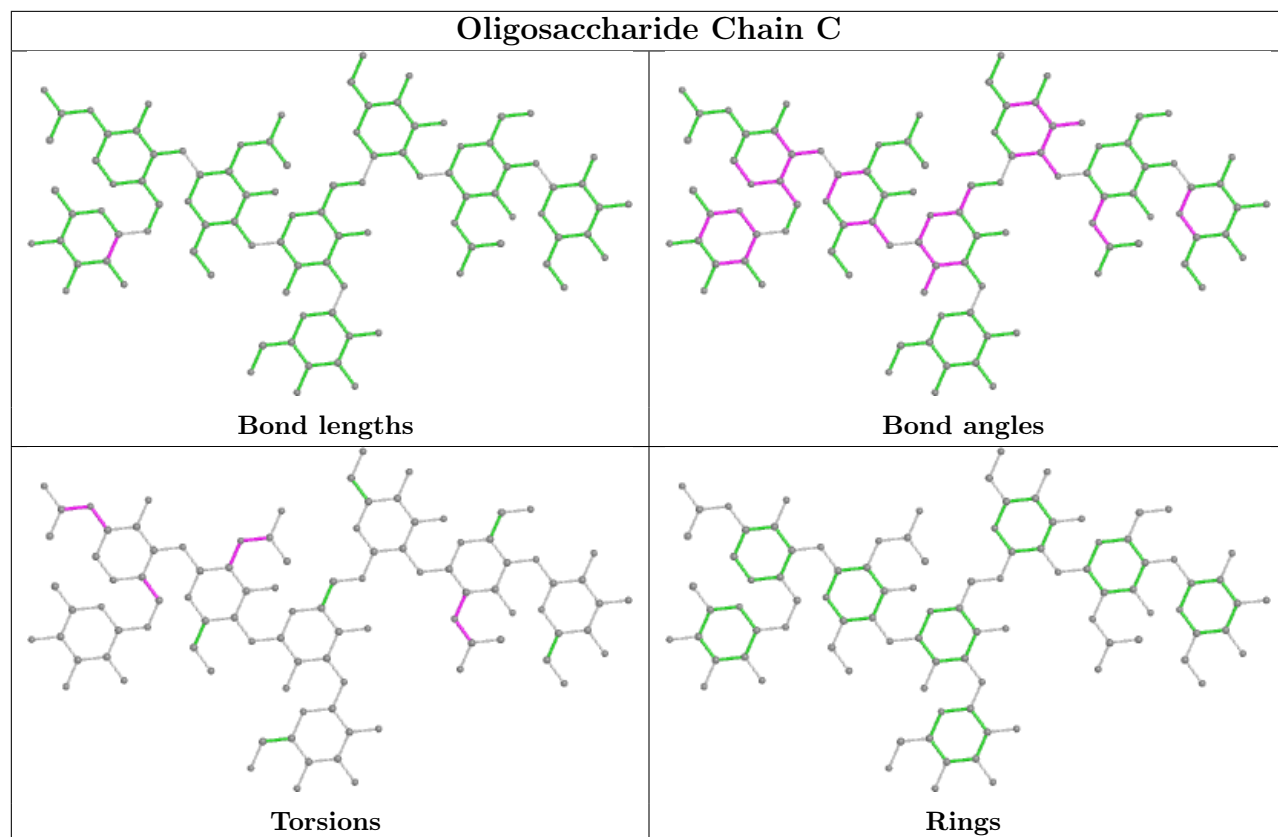
*Continued on next page...*

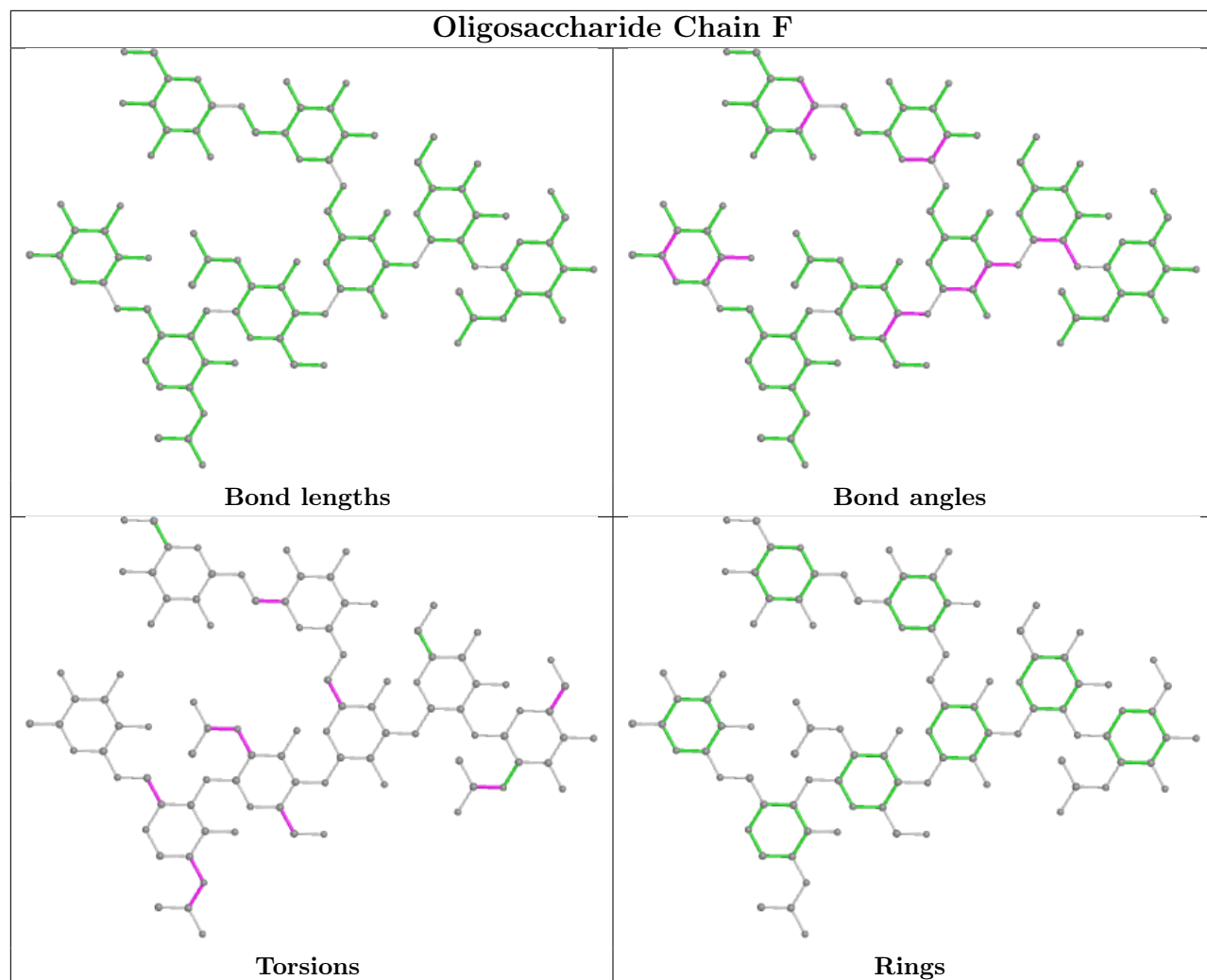
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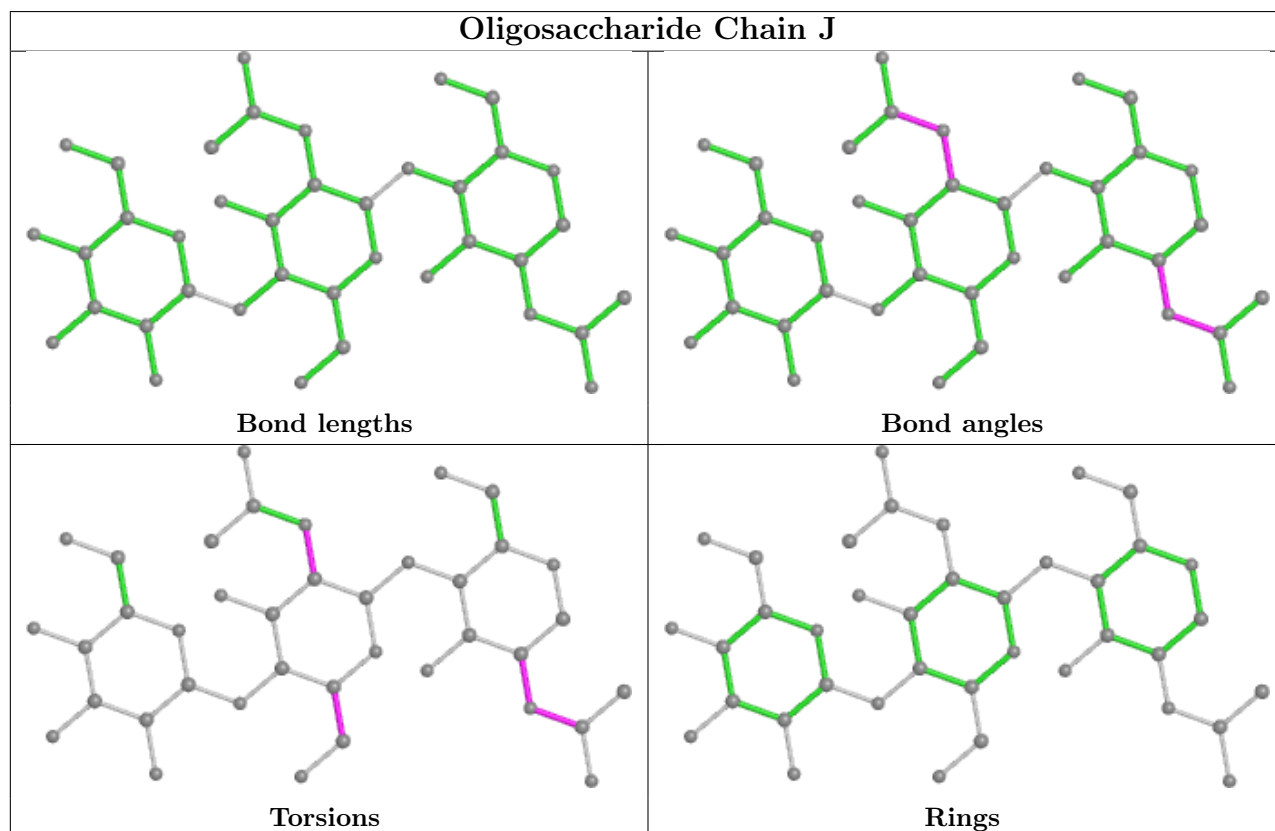
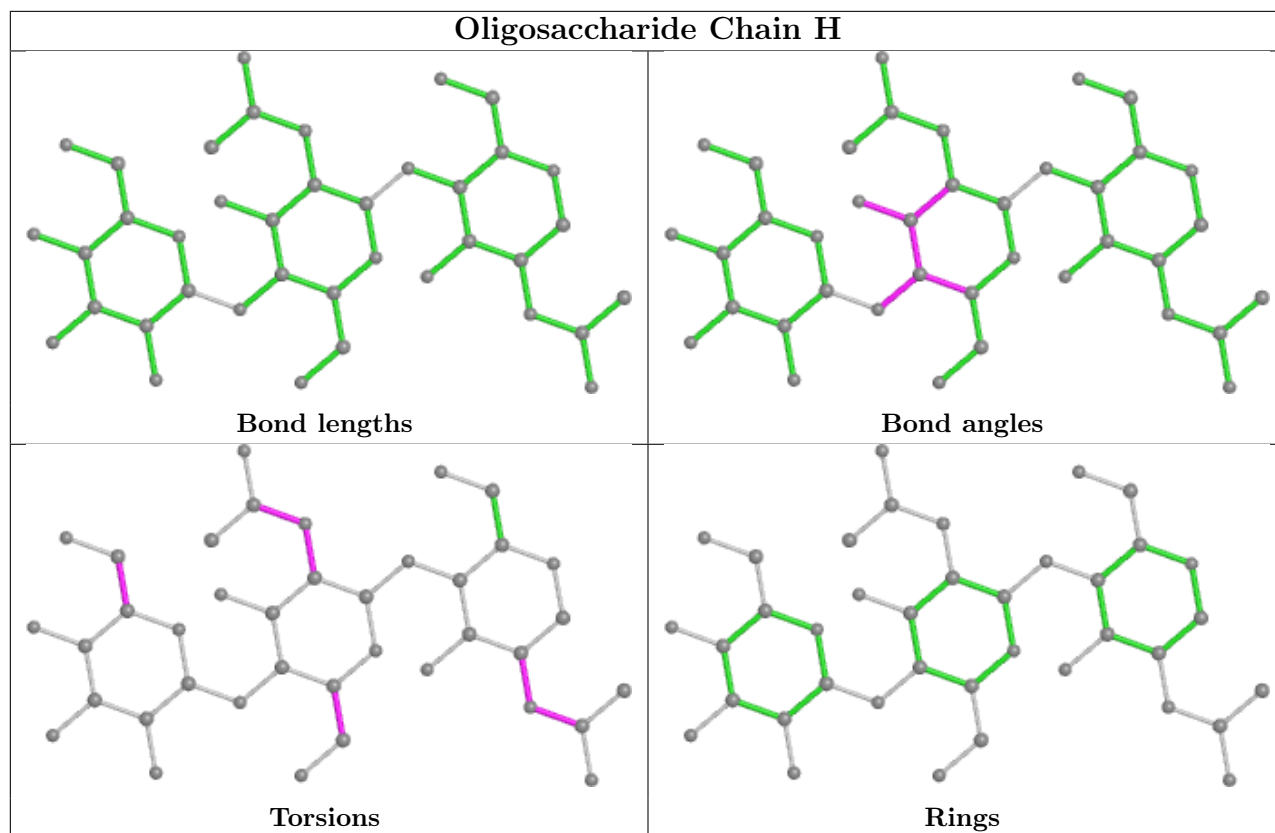
| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 18  | T     | 7   | MAN  | 1       | 0            |
| 11  | I     | 2   | NAG  | 2       | 0            |
| 9   | F     | 4   | MAN  | 1       | 0            |
| 13  | L     | 1   | NAG  | 2       | 0            |
| 11  | I     | 1   | NAG  | 3       | 0            |
| 15  | O     | 6   | MAN  | 2       | 0            |

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

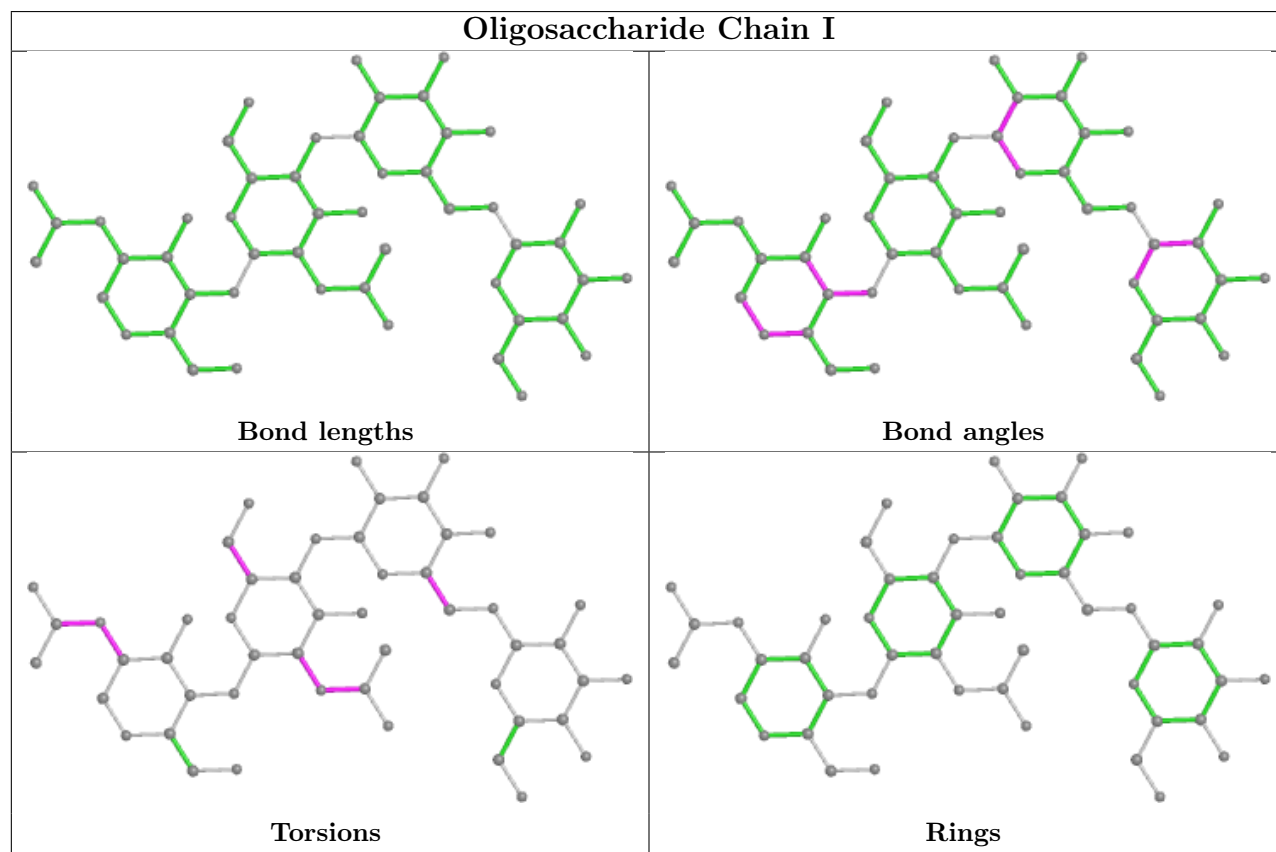
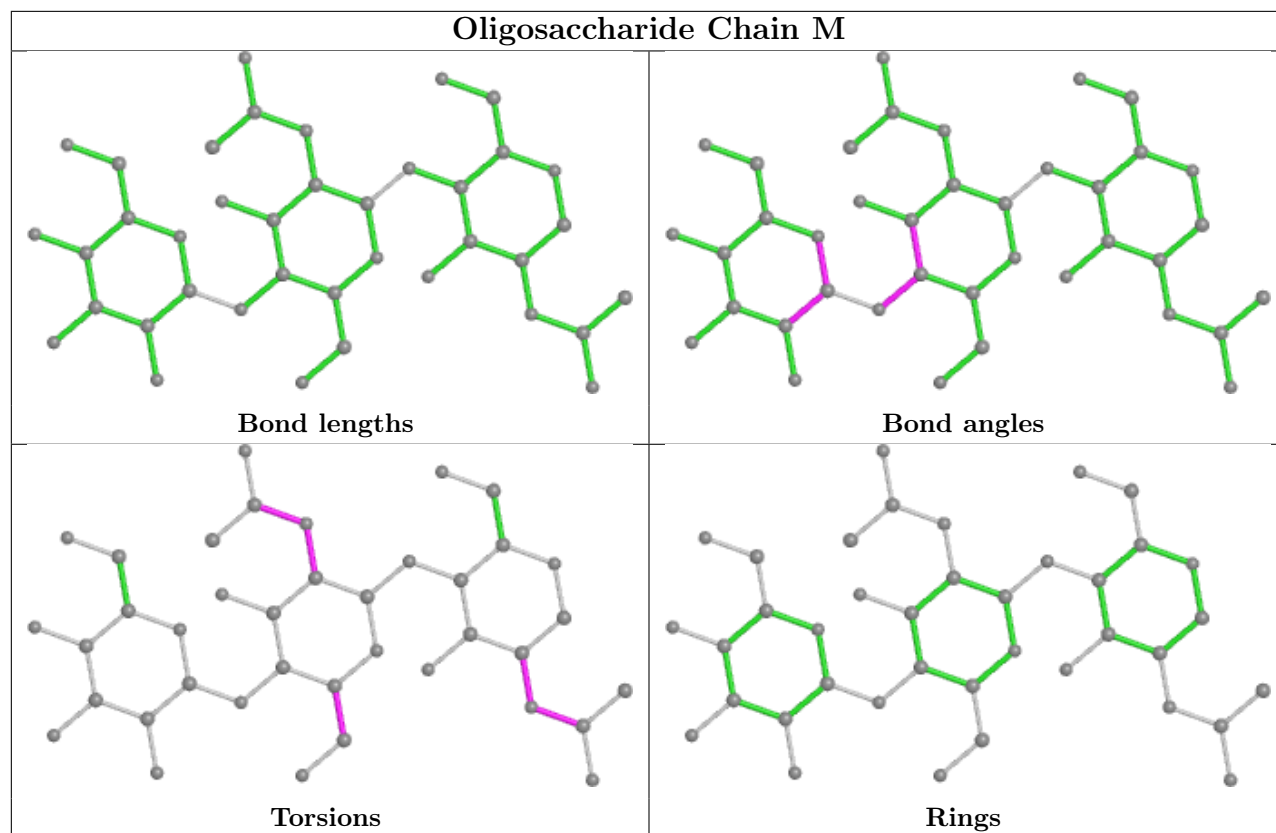


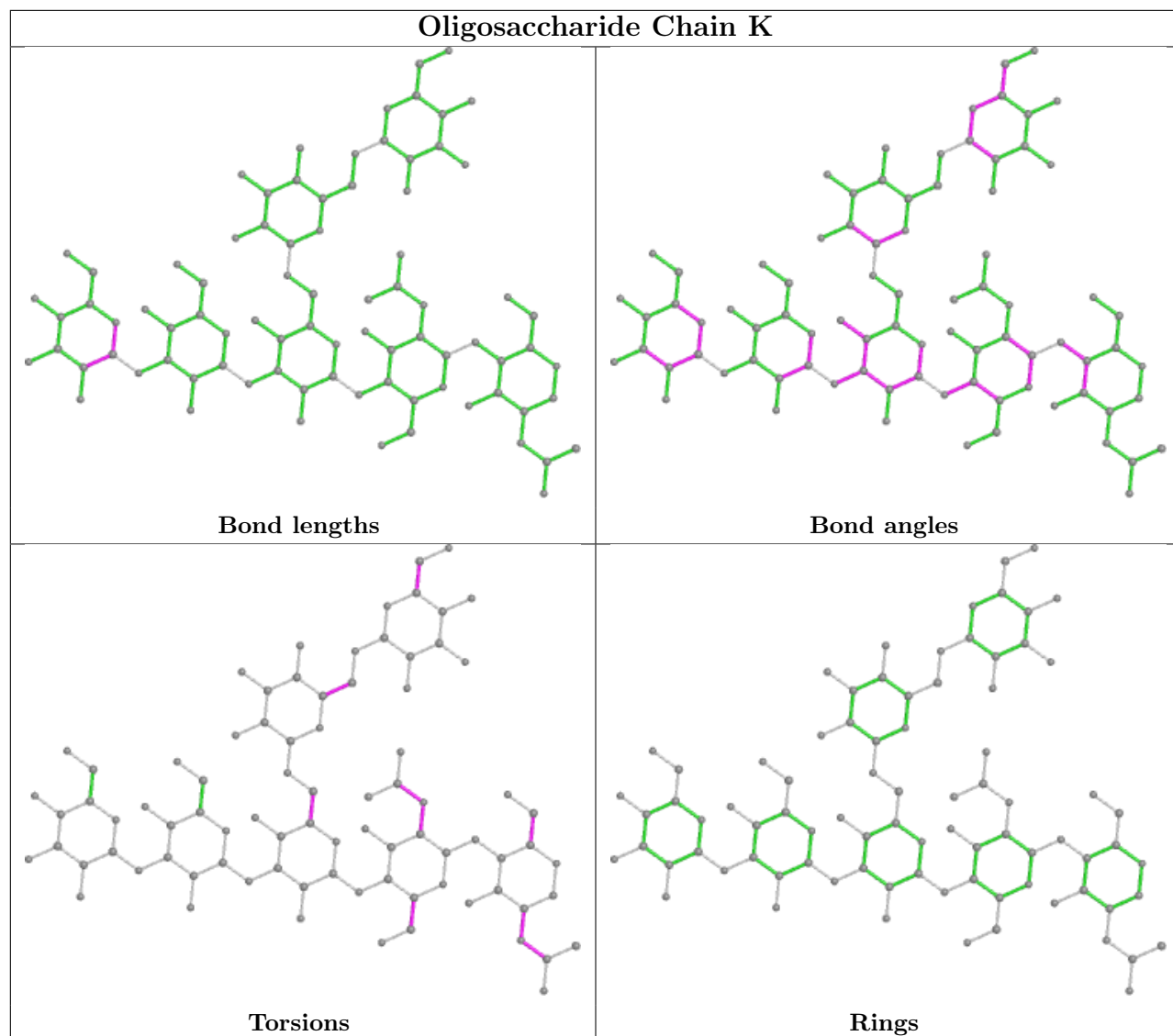


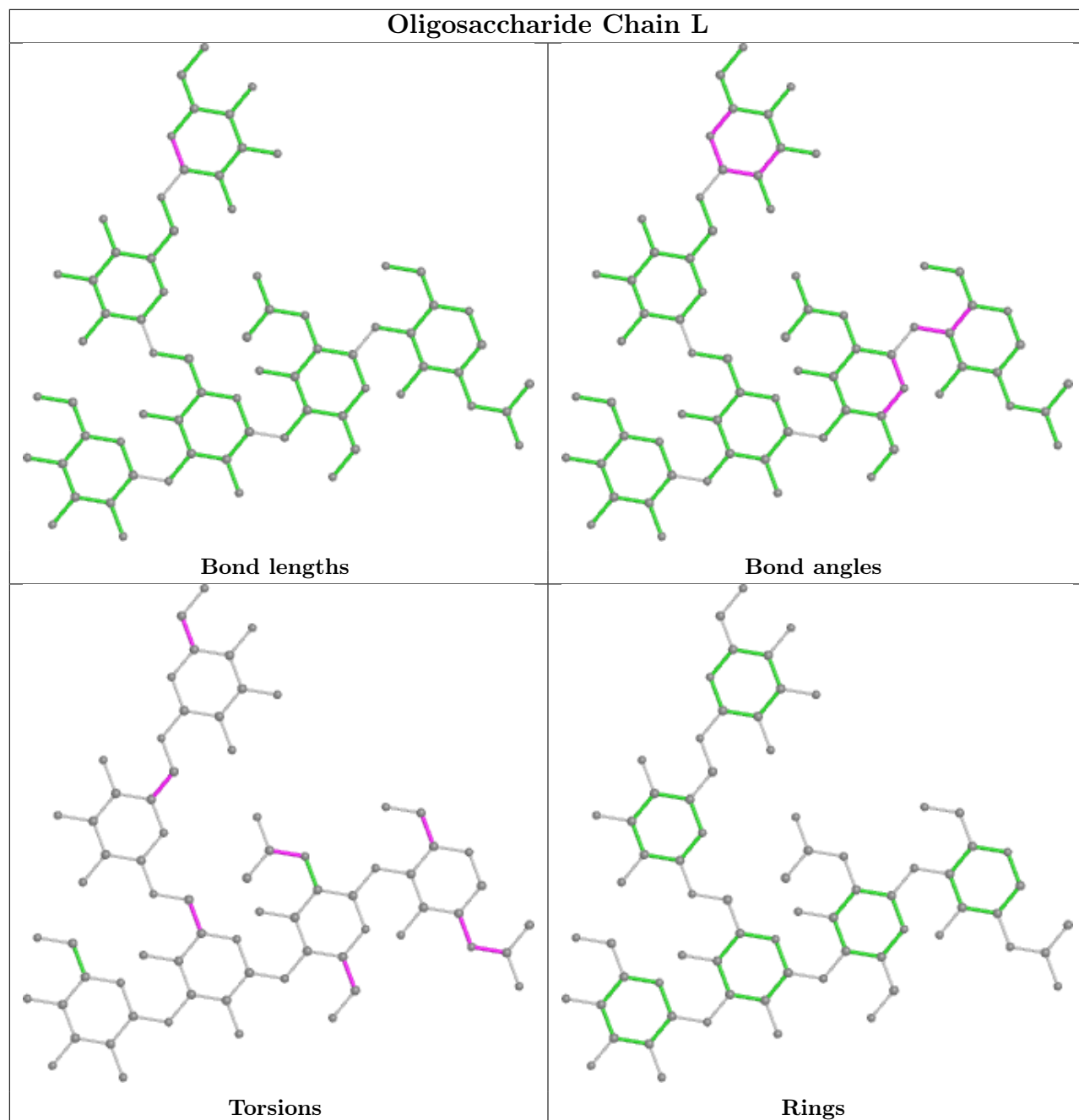


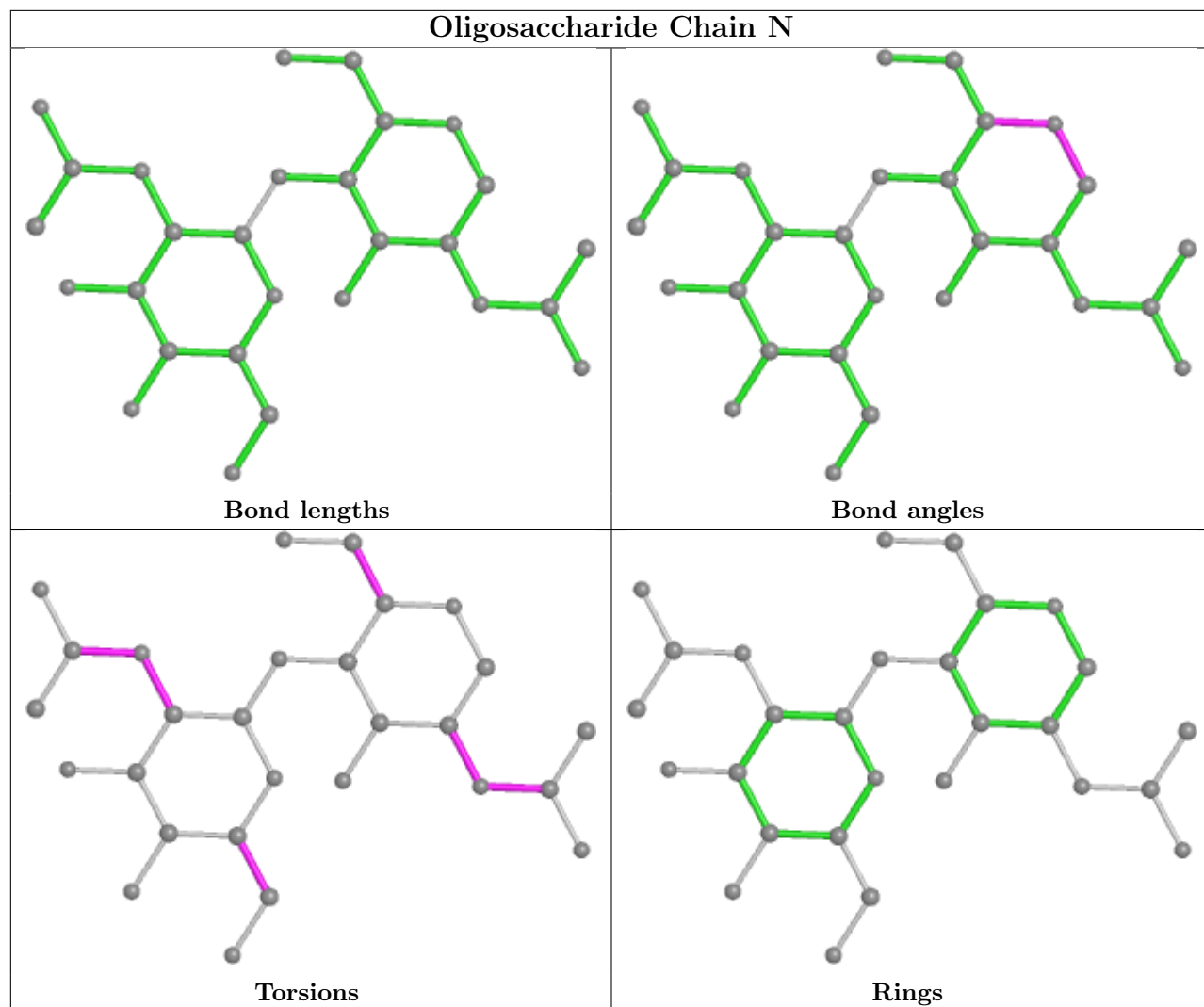


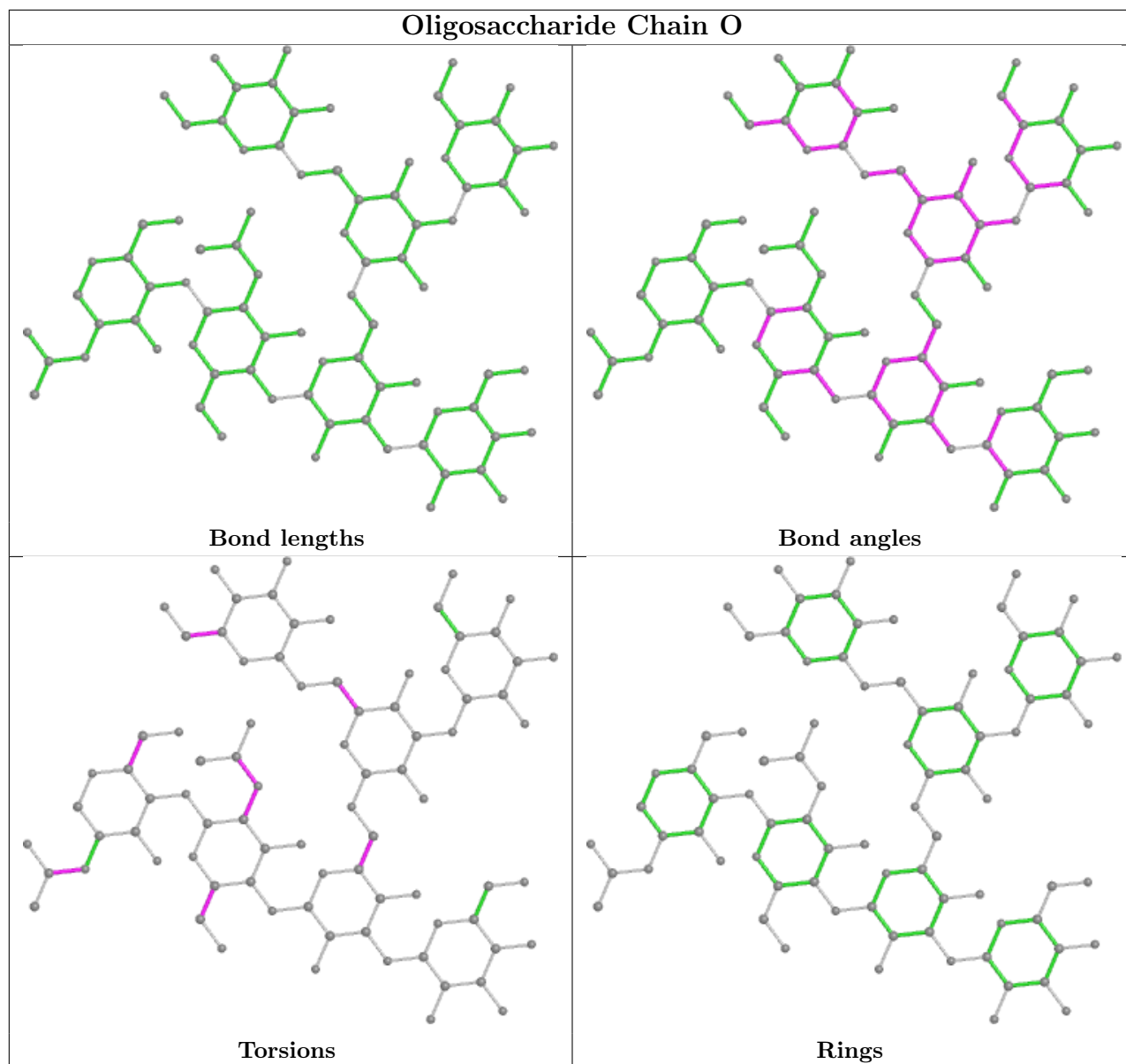


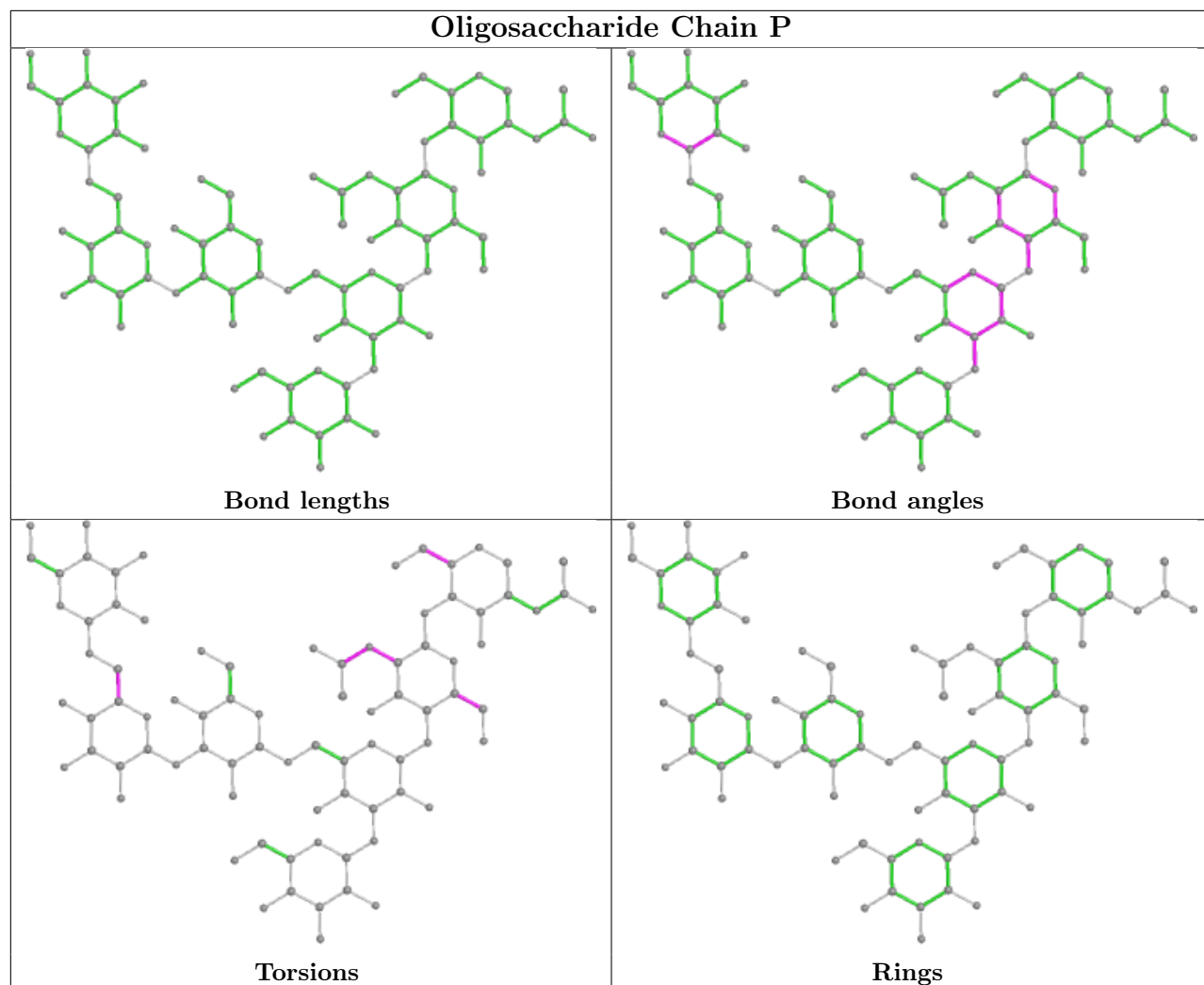


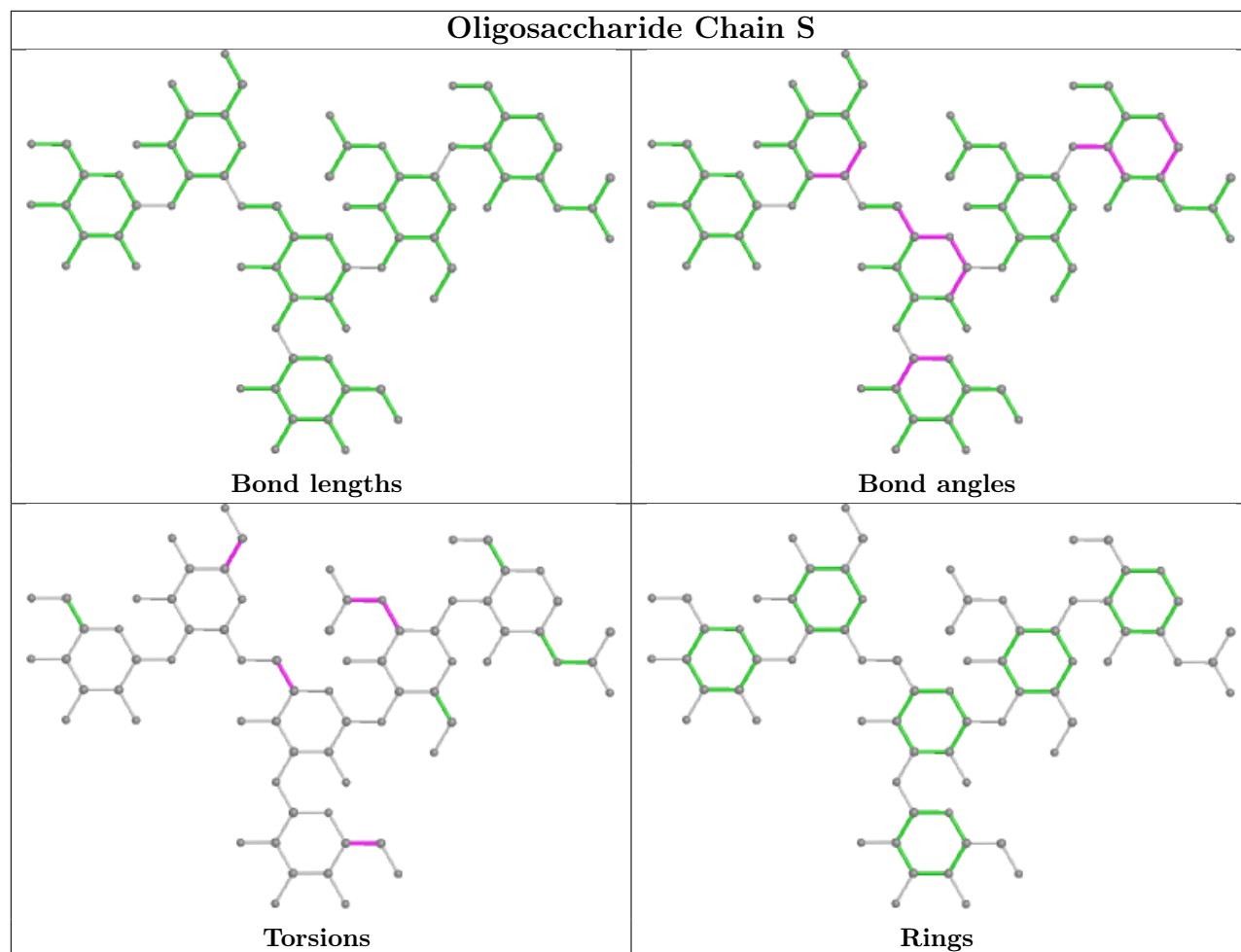


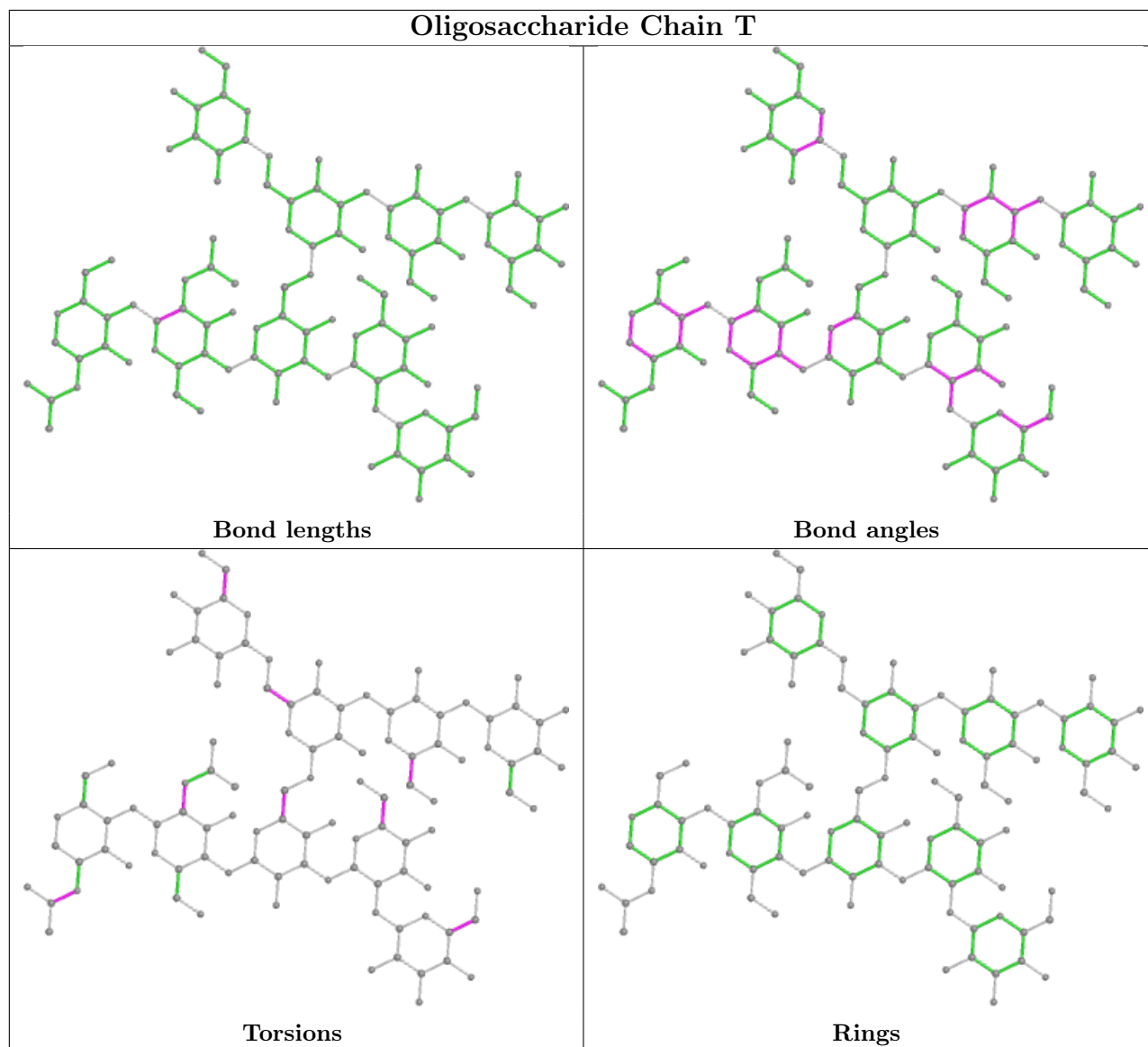












## 5.6 Ligand geometry [i](#)

3 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$ |
| 19  | NAG  | B     | 701 | 1    | 14,14,15     | 0.38 | 0           | 17,19,21    | 0.76 | 0           |



| Mol | Type | Chain | Res | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|-----|------|--------------|------|----------|-------------|------|----------|
|     |      |       |     |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 19  | NAG  | G     | 633 | 4    | 14,14,15     | 0.29 | 0        | 17,19,21    | 0.75 | 0        |
| 19  | NAG  | G     | 601 | 4    | 14,14,15     | 0.29 | 0        | 17,19,21    | 0.66 | 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   |
|-----|------|-------|-----|------|---------|-----------|---------|
| 19  | NAG  | B     | 701 | 1    | -       | 2/6/23/26 | 0/1/1/1 |
| 19  | NAG  | G     | 633 | 4    | -       | 3/6/23/26 | 0/1/1/1 |
| 19  | NAG  | G     | 601 | 4    | -       | 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 (7) torsion outliers are listed below:

| Mol | Chain | Res | Type | Atoms       |
|-----|-------|-----|------|-------------|
| 19  | G     | 633 | NAG  | C8-C7-N2-C2 |
| 19  | G     | 633 | NAG  | O7-C7-N2-C2 |
| 19  | B     | 701 | NAG  | C8-C7-N2-C2 |
| 19  | B     | 701 | NAG  | O7-C7-N2-C2 |
| 19  | G     | 601 | NAG  | O5-C5-C6-O6 |
| 19  | G     | 633 | NAG  | O5-C5-C6-O6 |
| 19  | G     | 601 | NAG  | C8-C7-N2-C2 |

There are no ring outliers.

1 monomer is involved in 1 short contact:

| Mol | Chain | Res | Type | Clashes | Symm-Clashes |
|-----|-------|-----|------|---------|--------------|
| 19  | B     | 701 | NAG  | 1       | 0            |

## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

Unable to reproduce the depositor's R factor - this section is therefore empty.

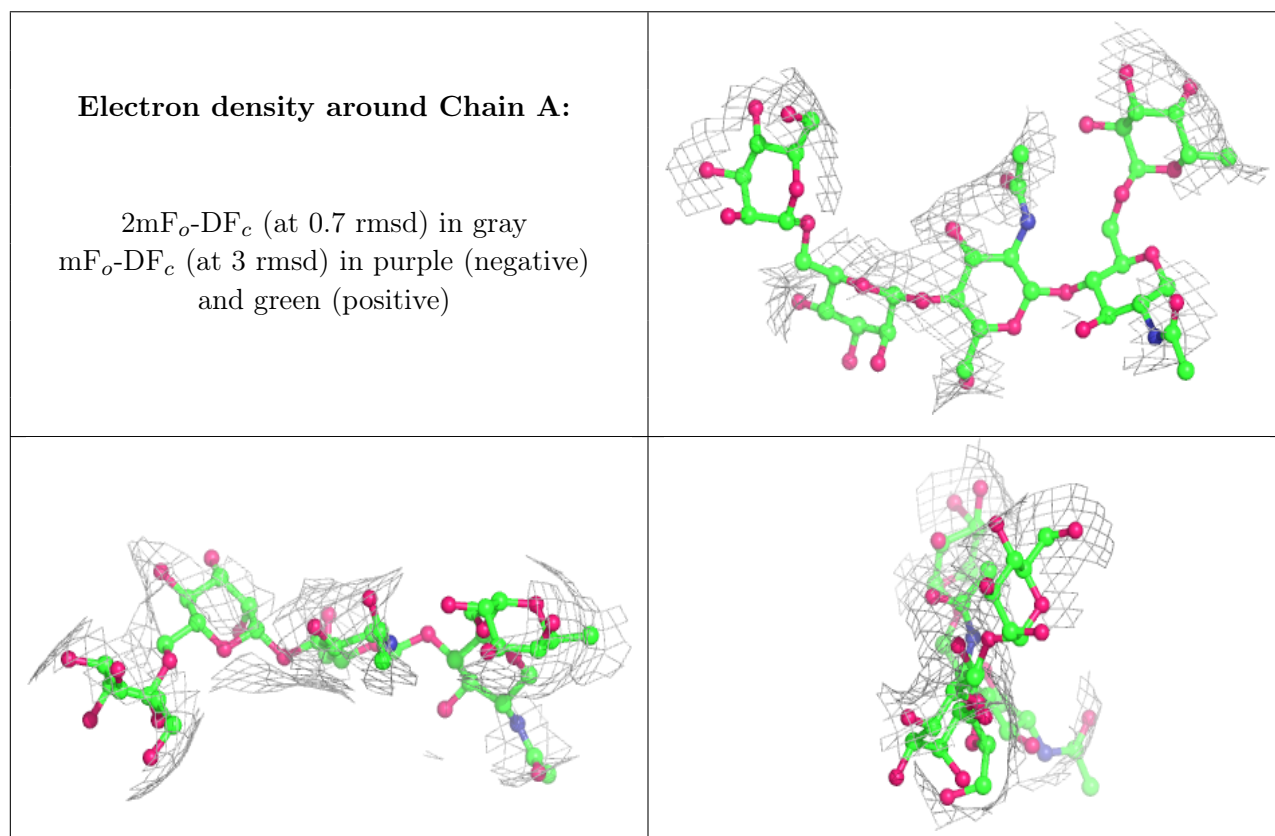
### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

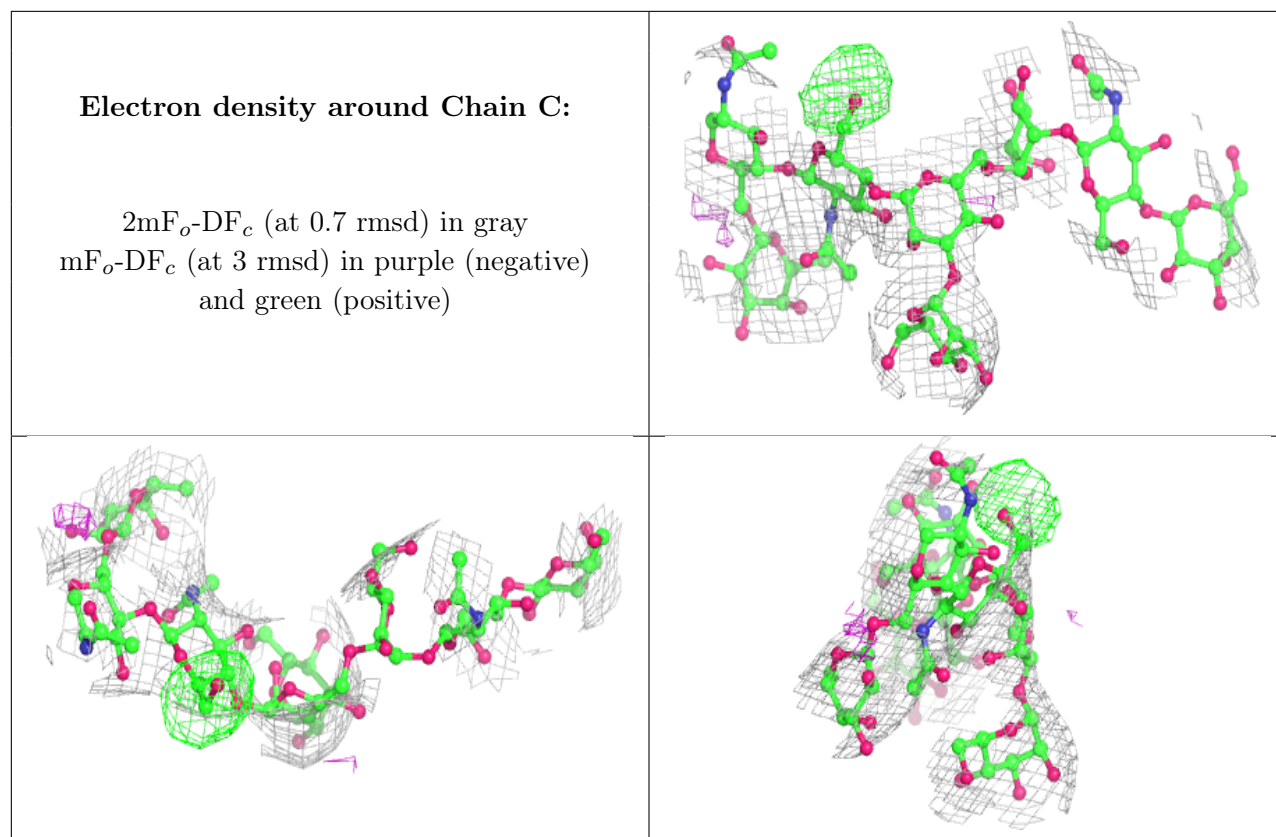
Unable to reproduce the depositor's R factor - this section is therefore empty.

### 6.3 Carbohydrates [i](#)

Unable to reproduce the depositor's R factor - this section is therefore empty.

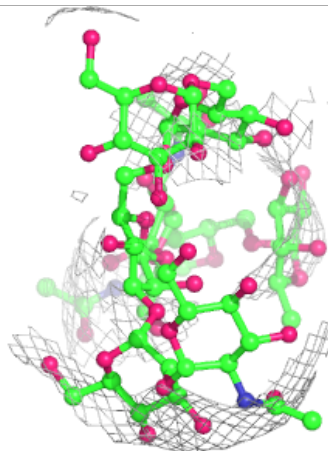
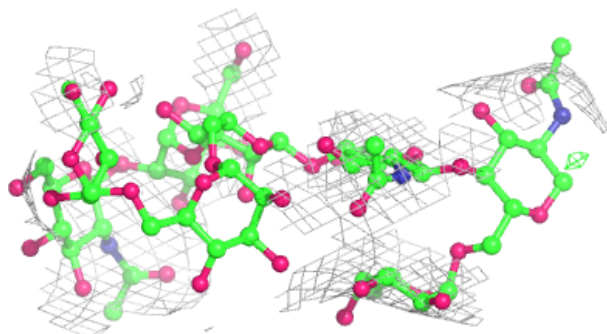
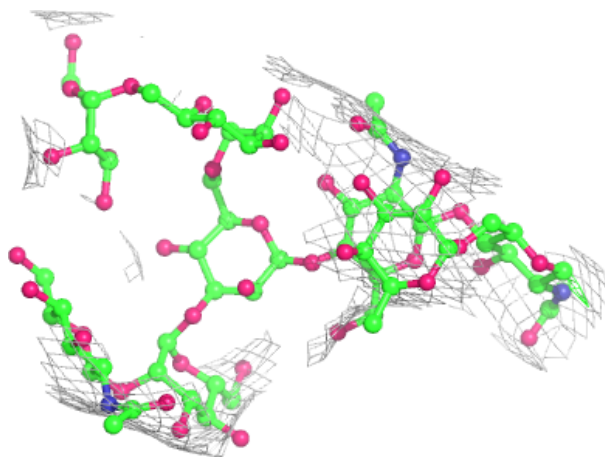
The following is a graphical depiction of the model fit to experimental electron density for oligosaccharide. Each fit is shown from different orientation to approximate a three-dimensional view.





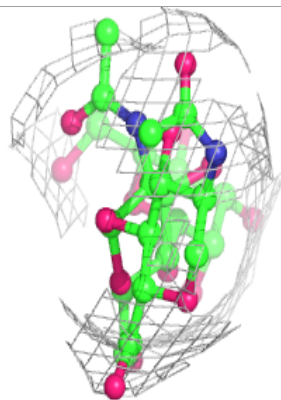
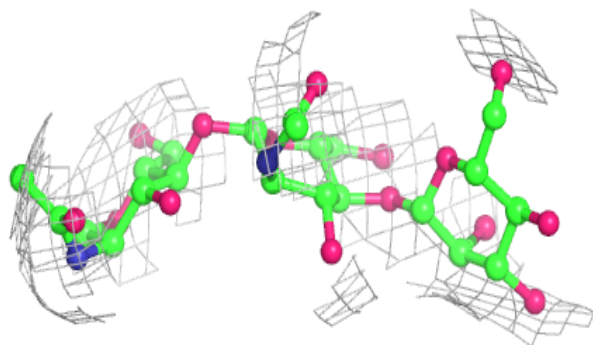
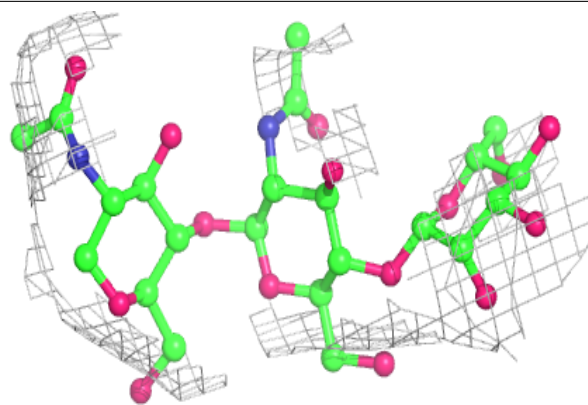
**Electron density around Chain F:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

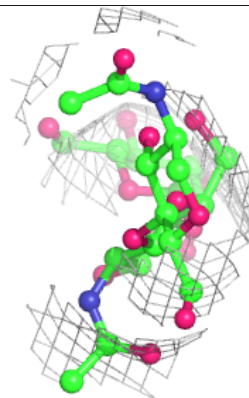
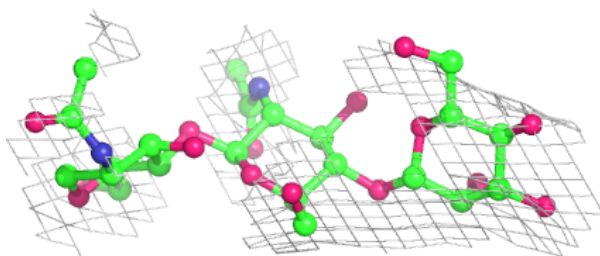
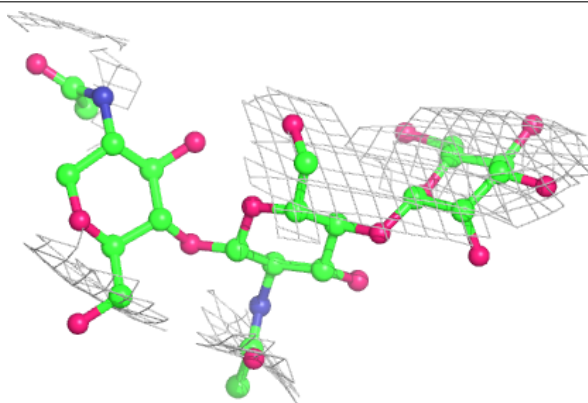


**Electron density around Chain H:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

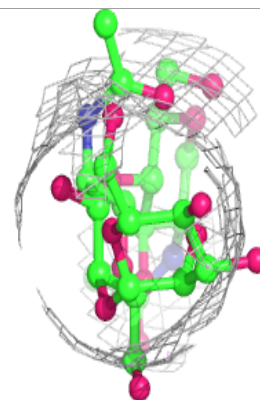
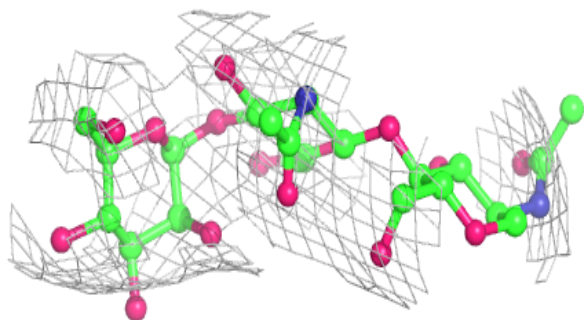
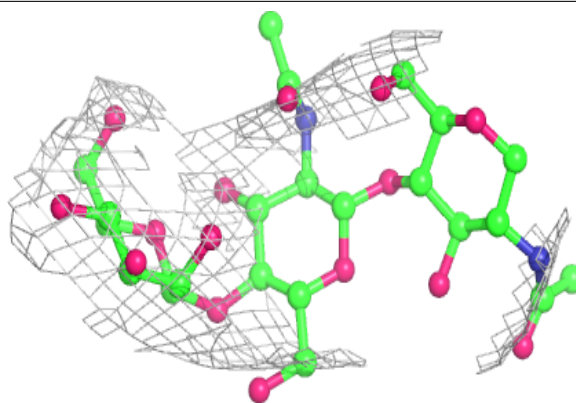
**Electron density around Chain J:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

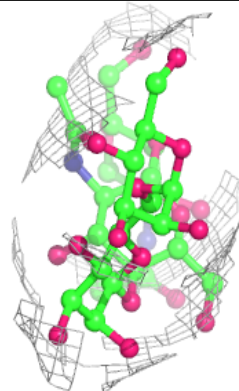
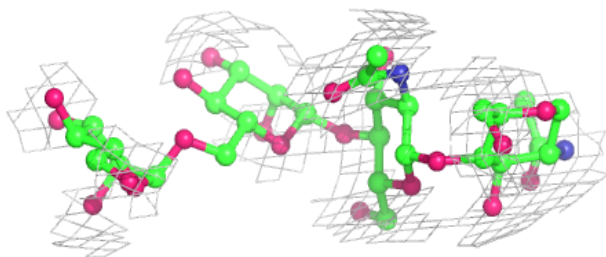
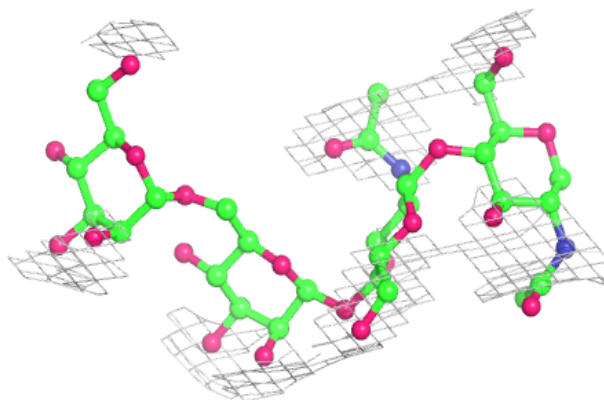


**Electron density around Chain M:**

$2mF_o-DF_c$  (at 0.7 rnsd) in gray  
 $mF_o-DF_c$  (at 3 rnsd) in purple (negative)  
and green (positive)

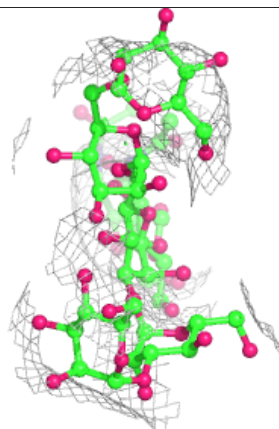
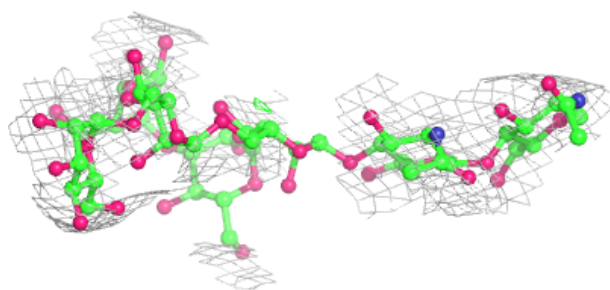
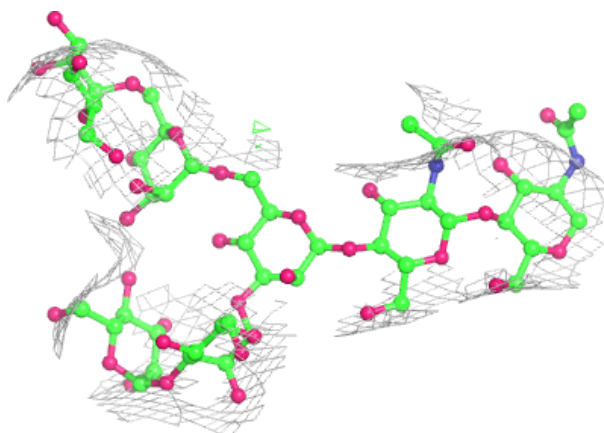
**Electron density around Chain I:**

$2mF_o-DF_c$  (at 0.7 rnsd) in gray  
 $mF_o-DF_c$  (at 3 rnsd) in purple (negative)  
and green (positive)

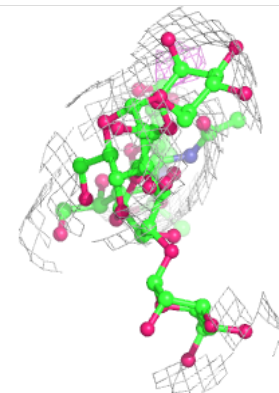
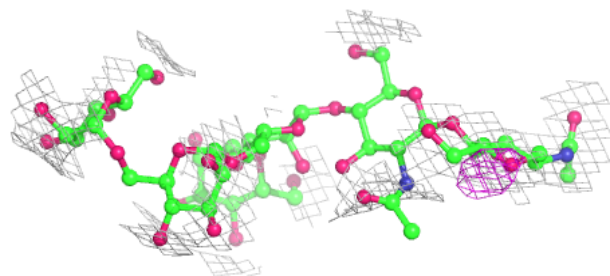
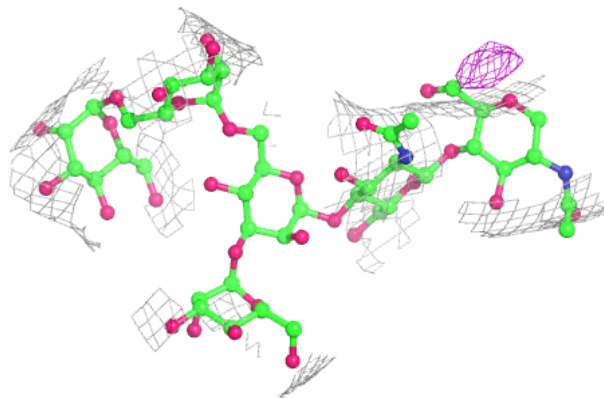


**Electron density around Chain K:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

**Electron density around Chain L:**

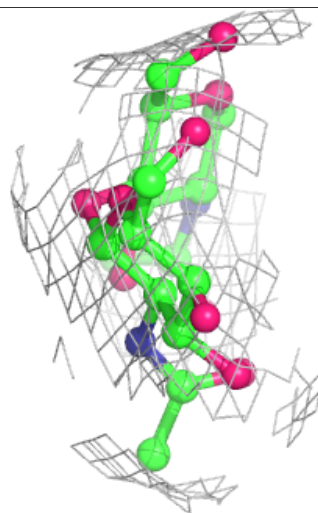
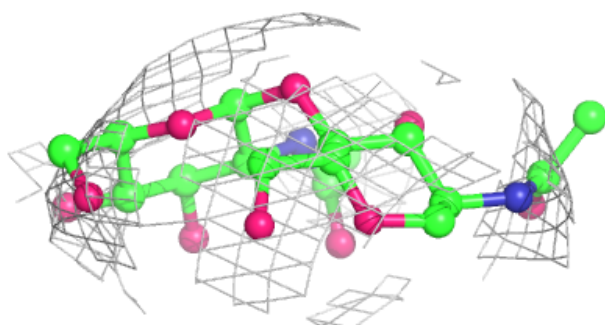
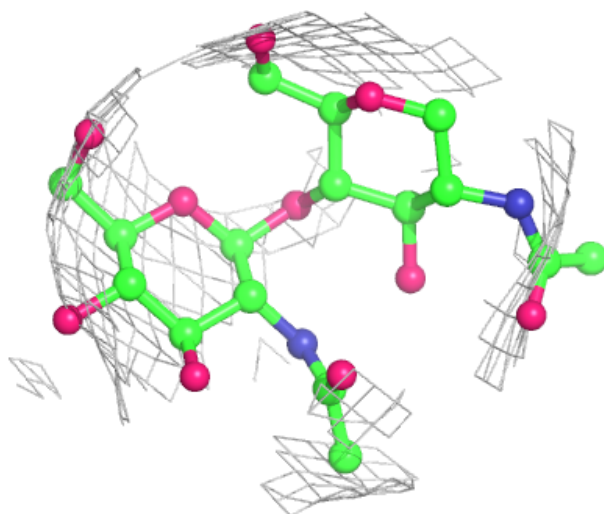
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

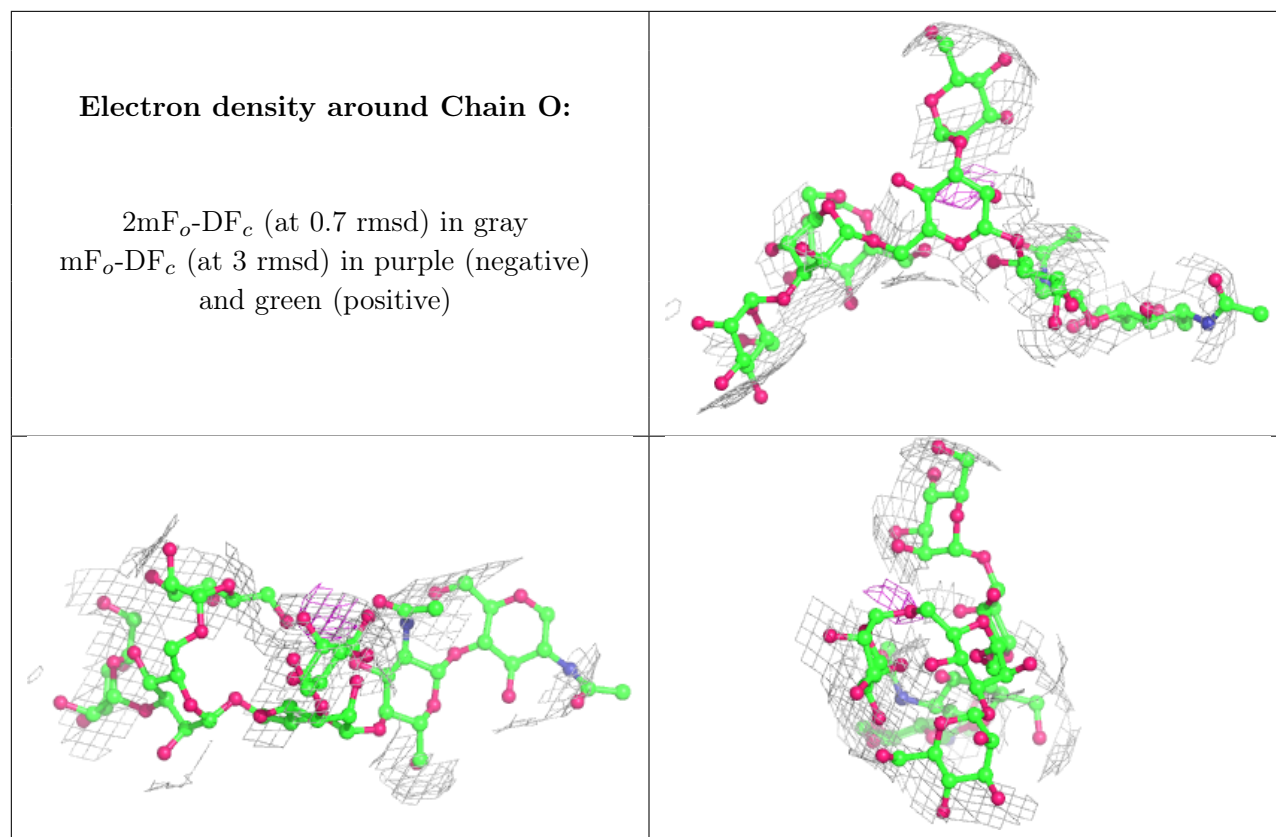




**Electron density around Chain N:**

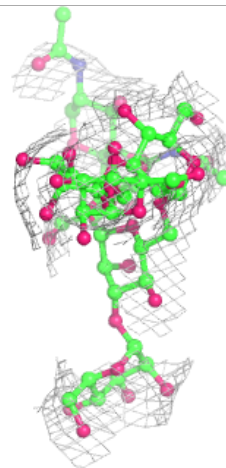
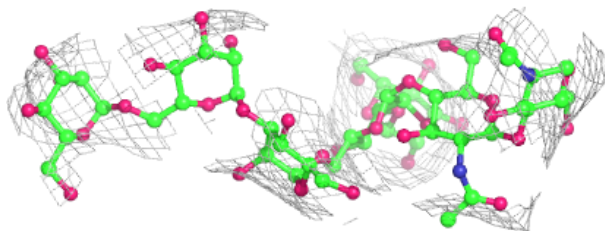
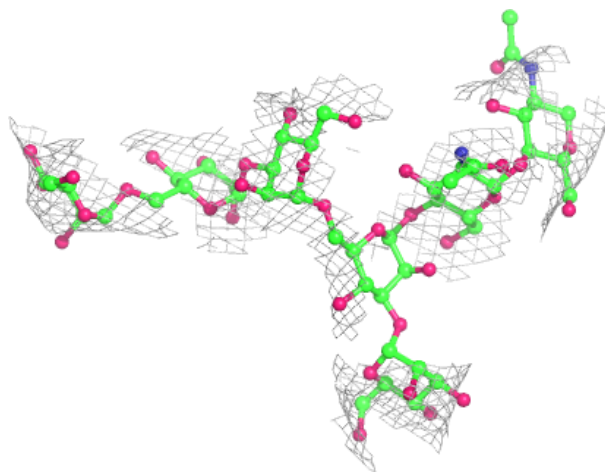
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)

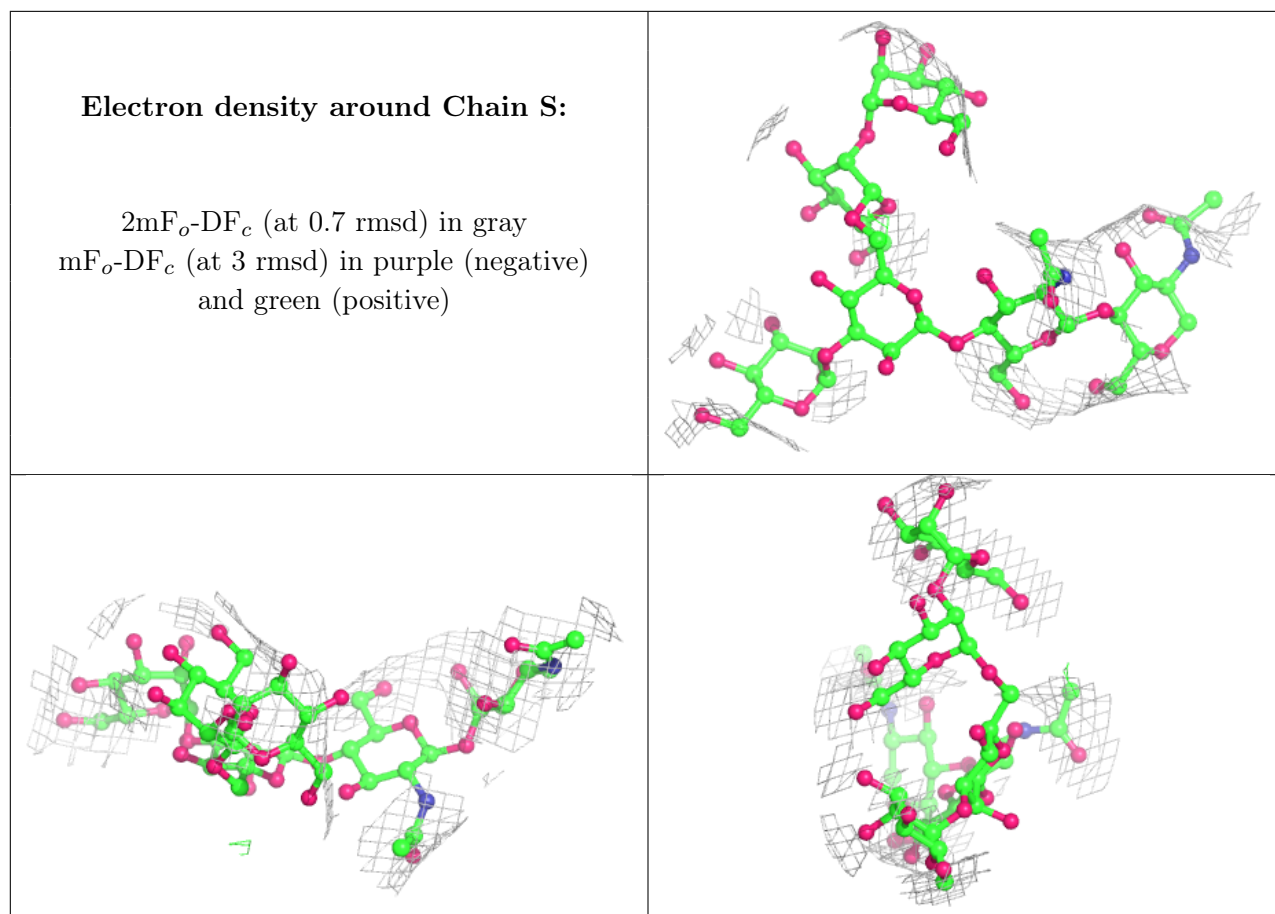


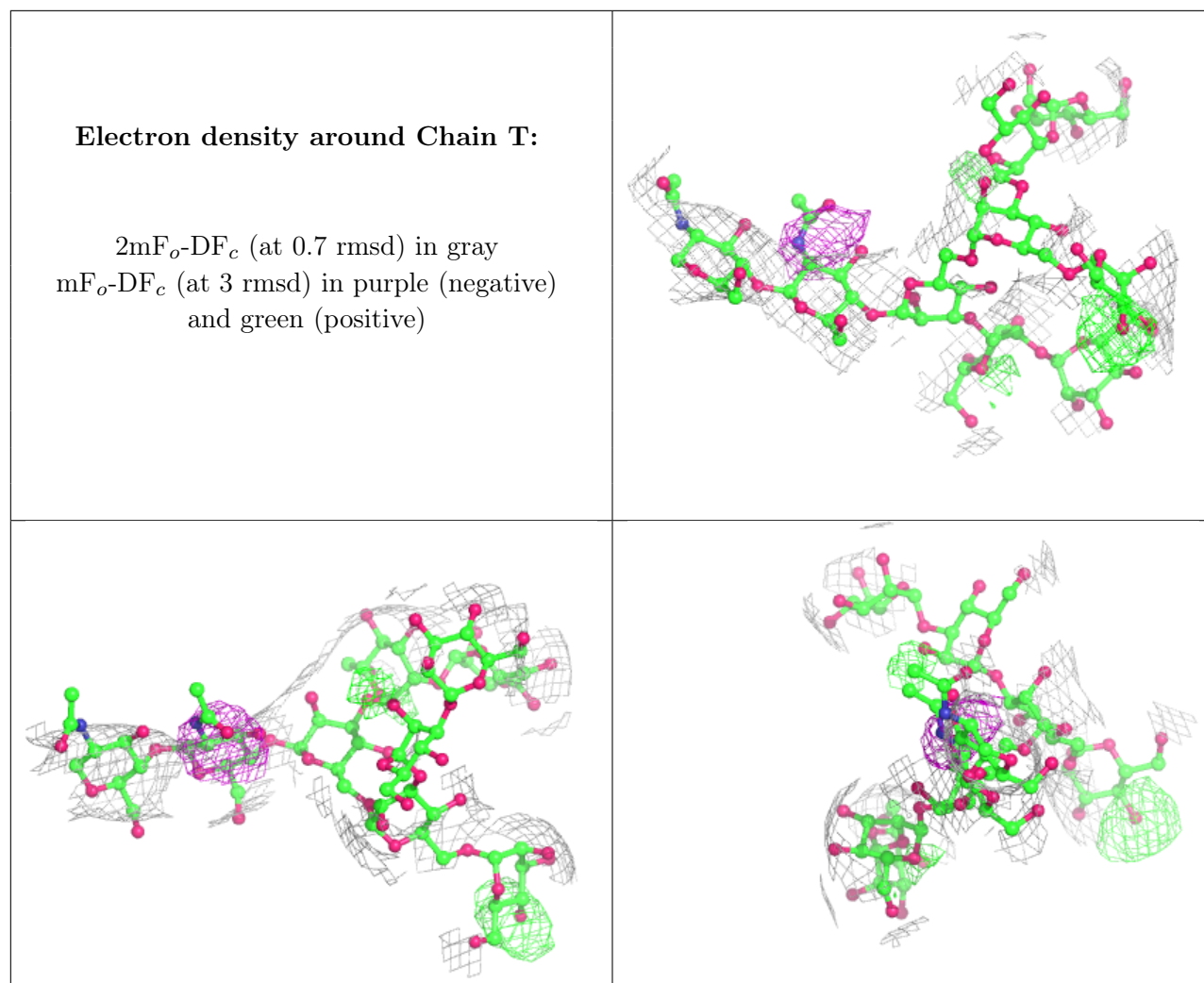


**Electron density around Chain P:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)







## 6.4 Ligands [i](#)

Unable to reproduce the depositor's R factor - this section is therefore empty.

## 6.5 Other polymers [i](#)

Unable to reproduce the depositor's R factor - this section is therefore empty.