



## Full wwPDB EM Validation Report ⓘ

Feb 9, 2026 – 07:50 PM EST

PDB ID : 9PGF / pdb\_00009pgf  
EMDB ID : EMD-71630  
Title : In situ structure of the human mitoribosome in the P state  
Authors : Wang, S.; Xiong, Y.; Zhang, Y.  
Deposited on : 2025-07-07  
Resolution : 2.93 Å(reported)

This is a Full wwPDB EM Validation Report for a publicly released PDB entry.

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

EMDB validation analysis : 0.0.1.dev131  
Mogul : 2022.3.0, CSD as543be (2022)  
MolProbity : 4-5-2 with Phenix2.0  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.48

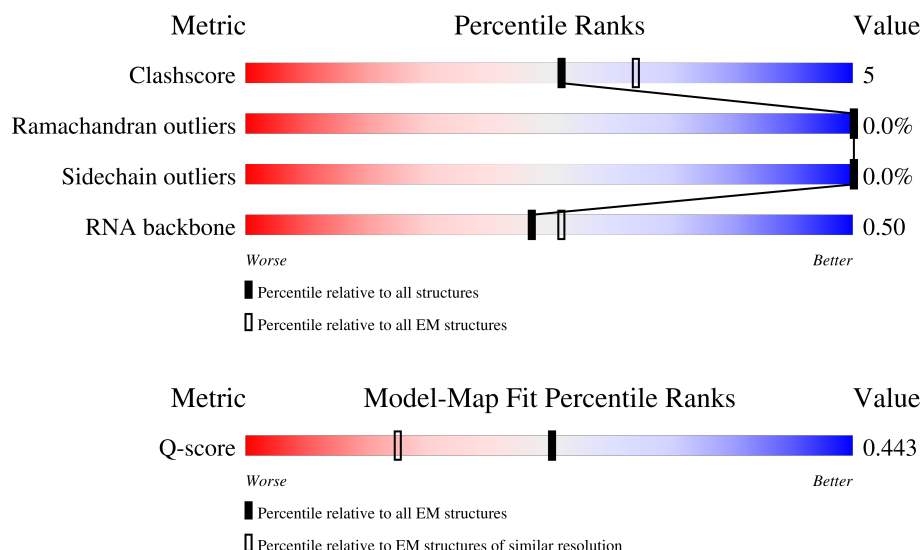
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.93 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



| Metric                | Whole archive<br>(#Entries) | EM structures<br>(#Entries) | Similar EM resolution<br>(#Entries, resolution range(Å)) |
|-----------------------|-----------------------------|-----------------------------|----------------------------------------------------------|
| Clashscore            | 210492                      | 15764                       | -                                                        |
| Ramachandran outliers | 207382                      | 16835                       | -                                                        |
| Sidechain outliers    | 206894                      | 16415                       | -                                                        |
| RNA backbone          | 6643                        | 2191                        | -                                                        |
| Q-score               | -                           | 25397                       | 13037 ( 2.43 - 3.43 )                                    |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion  $< 40\%$ ). The numeric value is given above the bar.

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1   | 0     | 188    |                  |
| 2   | 1     | 65     |                  |
| 3   | 2     | 92     |                  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 4   | 3     | 188    |                  |
| 5   | 4     | 103    |                  |
| 6   | 5     | 423    |                  |
| 7   | 6     | 380    |                  |
| 8   | 7     | 338    |                  |
| 9   | 8     | 206    |                  |
| 10  | 9     | 137    |                  |
| 11  | A     | 1561   |                  |
| 12  | C     | 297    |                  |
| 13  | D     | 305    |                  |
| 14  | E     | 348    |                  |
| 15  | F     | 311    |                  |
| 16  | H     | 267    |                  |
| 17  | J     | 192    |                  |
| 18  | K     | 178    |                  |
| 19  | L     | 145    |                  |
| 20  | M     | 296    |                  |
| 21  | N     | 251    |                  |
| 22  | O     | 175    |                  |
| 23  | P     | 180    |                  |
| 24  | Q     | 292    |                  |
| 25  | R     | 149    |                  |
| 26  | S     | 205    |                  |
| 27  | T     | 206    |                  |
| 28  | U     | 153    |                  |

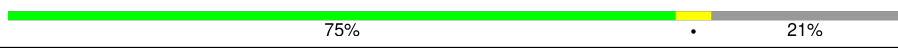
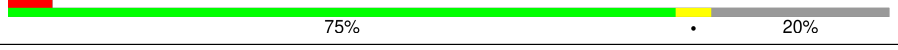
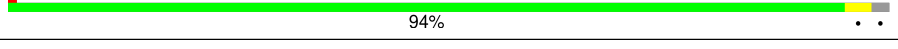
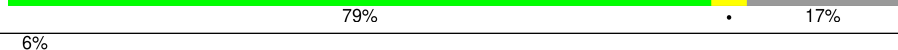
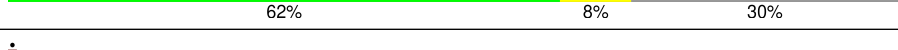
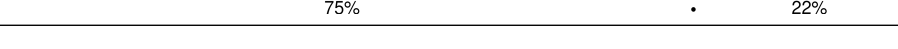
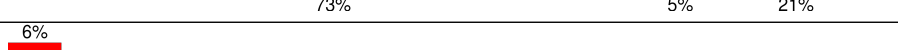
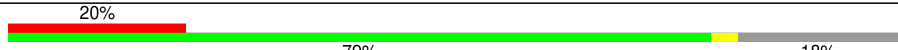
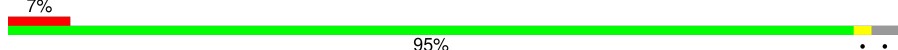
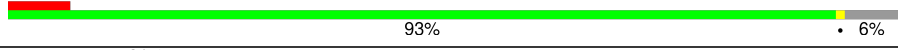
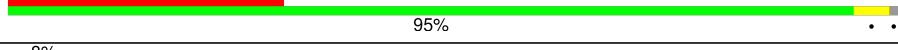
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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 29  | W     | 148    |                  |
| 30  | X     | 256    |                  |
| 31  | Y     | 250    |                  |
| 32  | Z     | 161    |                  |
| 33  | G     | 198    |                  |
| 33  | t     | 198    |                  |
| 33  | u     | 198    |                  |
| 34  | I     | 261    |                  |
| 35  | V     | 216    |                  |
| 36  | b     | 215    |                  |
| 37  | d     | 306    |                  |
| 38  | e     | 279    |                  |
| 39  | g     | 166    |                  |
| 40  | h     | 158    |                  |
| 41  | i     | 128    |                  |
| 42  | j     | 123    |                  |
| 43  | l     | 138    |                  |
| 44  | m     | 128    |                  |
| 45  | n     | 43     |                  |
| 46  | o     | 102    |                  |
| 47  | q     | 222    |                  |
| 48  | r     | 196    |                  |
| 49  | c     | 332    |                  |
| 50  | f     | 212    |                  |
| 51  | p     | 206    |                  |

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| Mol | Chain | Length | Quality of chain                                                                     |
|-----|-------|--------|--------------------------------------------------------------------------------------|
| 52  | s     | 439    |    |
| 53  | AB    | 296    |    |
| 54  | AC    | 167    |    |
| 55  | AD    | 430    |    |
| 56  | AE    | 125    |    |
| 57  | AF    | 242    |    |
| 58  | AG    | 396    |    |
| 59  | AH    | 201    |    |
| 60  | AJ    | 138    |    |
| 61  | AK    | 128    |    |
| 62  | AL    | 257    |    |
| 63  | AM    | 137    |  |
| 64  | AN    | 130    |  |
| 65  | AO    | 258    |  |
| 66  | AP    | 142    |  |
| 67  | AR    | 360    |  |
| 68  | AS    | 190    |  |
| 69  | AT    | 173    |  |
| 70  | AU    | 205    |  |
| 71  | AV    | 414    |  |
| 72  | AW    | 187    |  |
| 73  | AZ    | 106    |  |
| 74  | A0    | 217    |  |
| 75  | A1    | 323    |  |
| 76  | A3    | 199    |  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 77  | Az    | 34     |                  |
| 78  | AY    | 395    |                  |
| 79  | AA    | 954    |                  |
| 80  | AI    | 194    |                  |
| 81  | OX    | 435    |                  |
| 82  | a     | 142    |                  |
| 83  | Ax    | 71     |                  |
| 84  | A4    | 689    |                  |
| 85  | B     | 72     |                  |
| 86  | AX    | 398    |                  |
| 87  | A2    | 118    |                  |
| 88  | AQ    | 87     |                  |
| 89  | k     | 112    |                  |

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

| Mol | Type | Chain | Res  | Chirality | Geometry | Clashes | Electron density |
|-----|------|-------|------|-----------|----------|---------|------------------|
| 92  | SPD  | AG    | 401  | -         | -        | X       | -                |
| 98  | SPM  | AA    | 1782 | -         | -        | X       | -                |
| 98  | SPM  | AA    | 1784 | -         | -        | X       | -                |

## 2 Entry composition

There are 100 unique types of molecules in this entry. The entry contains 315253 atoms, of which 136488 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a protein called 39S ribosomal protein L32, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 1   | 0     | 110      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1815  | 554 | 917 | 176 | 162 | 6 |         |       |
|     |       |          |       |     |     |     |     |   |         |       |

- Molecule 2 is a protein called 39S ribosomal protein L33, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|----|---|---------|-------|
| 2   | 1     | 56       | Total | C   | H   | N  | O  | S | 0       | 0     |
|     |       |          | 977   | 296 | 513 | 89 | 77 | 2 |         |       |
|     |       |          |       |     |     |    |    |   |         |       |

- Molecule 3 is a protein called 39S ribosomal protein L34, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|----|---|---------|-------|
| 3   | 2     | 46       | Total | C   | H   | N  | O  | S | 0       | 0     |
|     |       |          | 784   | 233 | 407 | 83 | 60 | 1 |         |       |
|     |       |          |       |     |     |    |    |   |         |       |

- Molecule 4 is a protein called 39S ribosomal protein L35, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 4   | 3     | 95       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1716  | 539 | 884 | 162 | 128 | 3 |         |       |
|     |       |          |       |     |     |     |     |   |         |       |

- Molecule 5 is a protein called 39S ribosomal protein L36, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|----|---|---------|-------|
| 5   | 4     | 38       | Total | C   | H   | N  | O  | S | 0       | 0     |
|     |       |          | 704   | 217 | 362 | 72 | 49 | 4 |         |       |
|     |       |          |       |     |     |    |    |   |         |       |

- Molecule 6 is a protein called 39S ribosomal protein L37, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 6   | 5     | 394      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 6419  | 2073 | 3209 | 560 | 566 | 11 |         |       |
|     |       |          |       |      |      |     |     |    |         |       |

- Molecule 7 is a protein called 39S ribosomal protein L38, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 7   | 6     | 354      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 5792  | 1881 | 2844 | 525 | 533 | 9 |         |       |

- Molecule 8 is a protein called 39S ribosomal protein L39, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 8   | 7     | 294      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 4789  | 1529 | 2399 | 405 | 438 | 18 |         |       |

- Molecule 9 is a protein called 39S ribosomal protein L40, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 9   | 8     | 157      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2696  | 844 | 1369 | 235 | 246 | 2 |         |       |

- Molecule 10 is a protein called 39S ribosomal protein L41, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 10  | 9     | 124      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1985  | 644 | 988 | 170 | 181 | 2 |         |       |

- Molecule 11 is a RNA chain called 16S mitochondrial rRNA.

| Mol | Chain | Residues | Atoms |       |       |      |       |      | AltConf | Trace |
|-----|-------|----------|-------|-------|-------|------|-------|------|---------|-------|
| 11  | A     | 1558     | Total | C     | H     | N    | O     | P    | 0       | 0     |
|     |       |          | 49871 | 14843 | 16801 | 5963 | 10706 | 1558 |         |       |

- Molecule 12 is a protein called Translational activator of cytochrome c oxidase 1.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 12  | C     | 223      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1732  | 1072 | 310 | 340 | 10 |         |       |

- Molecule 13 is a protein called 39S ribosomal protein L2, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 13  | D     | 238      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 3780  | 1157 | 1921 | 376 | 317 | 9 |         |       |

- Molecule 14 is a protein called 39S ribosomal protein L3, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 14  | E     | 305      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 4822  | 1545 | 2416 | 418 | 432 | 11 |         |       |

- Molecule 15 is a protein called 39S ribosomal protein L4, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 15  | F     | 252      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 4097  | 1305 | 2066 | 370 | 350 | 6 |         |       |

- Molecule 16 is a protein called 39S ribosomal protein L9, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 16  | H     | 202      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 3397  | 1067 | 1736 | 304 | 286 | 4 |         |       |

- Molecule 17 is a protein called 39S ribosomal protein L11, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 17  | J     | 175      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2738  | 847 | 1408 | 237 | 244 | 2 |         |       |

- Molecule 18 is a protein called Large ribosomal subunit protein uL13m.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 18  | K     | 178      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2907  | 936 | 1452 | 259 | 253 | 7 |         |       |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment     | Reference  |
|-------|---------|----------|--------|-------------|------------|
| K     | 1       | ACE      | -      | acetylation | UNP Q9BYD1 |

- Molecule 19 is a protein called 39S ribosomal protein L14, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 19  | L     | 115      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1832  | 559 | 942 | 171 | 155 | 5 |         |       |

- Molecule 20 is a protein called 39S ribosomal protein L15, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 20  | M     | 291      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 4723  | 1483 | 2396 | 430 | 408 | 6 |         |       |

- Molecule 21 is a protein called 39S ribosomal protein L16, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 21  | N     | 222      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 3604  | 1143 | 1818 | 326 | 307 | 10 |         |       |

- Molecule 22 is a protein called 39S ribosomal protein L17, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 22  | O     | 154      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2554  | 792 | 1295 | 241 | 219 | 7 |         |       |

- Molecule 23 is a protein called 39S ribosomal protein L18, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 23  | P     | 144      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2339  | 733 | 1166 | 224 | 211 | 5 |         |       |

- Molecule 24 is a protein called 39S ribosomal protein L19, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 24  | Q     | 239      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 4021  | 1277 | 2031 | 353 | 351 | 9 |         |       |

- Molecule 25 is a protein called 39S ribosomal protein L20, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 25  | R     | 140      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2369  | 732 | 1215 | 231 | 187 | 4 |         |       |

- Molecule 26 is a protein called 39S ribosomal protein L21, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 26  | S     | 161      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2659  | 835 | 1366 | 227 | 227 | 4 |         |       |

- Molecule 27 is a protein called 39S ribosomal protein L22, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 27  | T     | 166      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2781  | 875 | 1412 | 254 | 233 | 7 |         |       |

- Molecule 28 is a protein called 39S ribosomal protein L23, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 28  | U     | 152      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2476  | 786 | 1228 | 234 | 225 | 3 |         |       |

- Molecule 29 is a protein called 39S ribosomal protein L27, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 29  | W     | 116      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1840  | 577 | 936 | 171 | 153 | 3 |         |       |

- Molecule 30 is a protein called 39S ribosomal protein L28, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 30  | X     | 244      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 4105  | 1322 | 2061 | 352 | 365 | 5 |         |       |

- Molecule 31 is a protein called 39S ribosomal protein L47, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 31  | Y     | 181      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 3154  | 995 | 1598 | 298 | 259 | 4 |         |       |

- Molecule 32 is a protein called 39S ribosomal protein L30, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 32  | Z     | 122      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2041  | 636 | 1045 | 186 | 171 | 3 |         |       |

- Molecule 33 is a protein called 39S ribosomal protein L12, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |    |  | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|--|---------|-------|
| 33  | G     | 72       | Total | C   | N   | O   |    |  | 0       | 0     |
|     |       |          | 558   | 358 | 97  | 103 |    |  |         |       |
| 33  | t     | 46       | Total | C   | H   | N   | O  |  | 0       | 0     |
|     |       |          | 732   | 228 | 378 | 56  | 70 |  |         |       |
| 33  | u     | 32       | Total | C   | H   | N   | O  |  | 0       | 0     |
|     |       |          | 541   | 168 | 284 | 40  | 49 |  |         |       |

- Molecule 34 is a protein called 39S ribosomal protein L10, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|----|---------|-------|
| 34  | I     | 181      | Total | C   | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 2979  | 932 | 1533 | 260 | 244 | 10 |         |       |

- Molecule 35 is a protein called 39S ribosomal protein L24, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 35  | V     | 205      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 3365  | 1068 | 1689 | 298 | 302 | 8 |         |       |

- Molecule 36 is a protein called 39S ribosomal protein L43, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 36  | b     | 150      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2379  | 742 | 1186 | 231 | 217 | 3 |         |       |

- Molecule 37 is a protein called 39S ribosomal protein L45, mitochondrial.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 37  | d     | 259      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2124  | 1357 | 369 | 384 | 14 |         |       |

- Molecule 38 is a protein called 39S ribosomal protein L46, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 38  | e     | 238      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 3848  | 1222 | 1917 | 339 | 364 | 6 |         |       |

- Molecule 39 is a protein called 39S ribosomal protein L49, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 39  | g     | 134      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2210  | 719 | 1097 | 193 | 199 | 2 |         |       |

- Molecule 40 is a protein called 39S ribosomal protein L50, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 40  | h     | 110      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1778  | 568 | 883 | 156 | 168 | 3 |         |       |

- Molecule 41 is a protein called 39S ribosomal protein L51, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 41  | i     | 97       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1687  | 532 | 859 | 165 | 127 | 4 |         |       |

- Molecule 42 is a protein called 39S ribosomal protein L52, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 42  | j     | 94       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1492  | 463 | 747 | 144 | 136 | 2 |         |       |

- Molecule 43 is a protein called 39S ribosomal protein L54, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 43  | l     | 82       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1363  | 437 | 675 | 120 | 128 | 3 |         |       |

- Molecule 44 is a protein called 39S ribosomal protein L55, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 44  | m     | 92       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1551  | 488 | 760 | 159 | 142 | 2 |         |       |

- Molecule 45 is a protein called Nascent polypeptide.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 45  | n     | 43       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 215   | 129 | 43 | 43 |         |       |

- Molecule 46 is a protein called Ribosomal protein 63, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 46  | o     | 94       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1604  | 501 | 806 | 165 | 129 | 3 |         |       |

- Molecule 47 is a protein called Growth arrest and DNA damage-inducible proteins-interacting protein 1.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 47  | q     | 177      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 2437  | 929 | 942 | 292 | 269 | 5 |         |       |

- Molecule 48 is a protein called 39S ribosomal protein S18a, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 48  | r     | 162      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2671  | 839 | 1349 | 252 | 223 | 8 |         |       |

- Molecule 49 is a protein called 39S ribosomal protein L44, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 49  | c     | 286      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 4621  | 1470 | 2322 | 397 | 423 | 9 |         |       |

- Molecule 50 is a protein called 39S ribosomal protein L48, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 50  | f     | 157      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2523  | 799 | 1271 | 207 | 242 | 4 |         |       |

- Molecule 51 is a protein called Peptidyl-tRNA hydrolase ICT1, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 51  | p     | 147      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2430  | 748 | 1225 | 228 | 225 | 4 |         |       |

- Molecule 52 is a protein called 39S ribosomal protein S30, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 52  | s     | 385      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 6285  | 2018 | 3137 | 558 | 558 | 14 |         |       |

- Molecule 53 is a protein called 28S ribosomal protein S2, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 53  | AB    | 225      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 3644  | 1164 | 1816 | 331 | 323 | 10 |         |       |

- Molecule 54 is a protein called 28S ribosomal protein S24, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 54  | AC    | 132      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2172  | 699 | 1089 | 195 | 185 | 4 |         |       |

- Molecule 55 is a protein called 28S ribosomal protein S5, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 55  | AD    | 343      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 5536  | 1713 | 2805 | 518 | 487 | 13 |         |       |

- Molecule 56 is a protein called 28S ribosomal protein S6, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 56  | AE    | 122      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 1972  | 614 | 1000 | 177 | 177 | 4 |         |       |

- Molecule 57 is a protein called 28S ribosomal protein S7, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 57  | AF    | 208      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 3496  | 1104 | 1771 | 312 | 298 | 11 |         |       |

- Molecule 58 is a protein called 28S ribosomal protein S9, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 58  | AG    | 327      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 5377  | 1710 | 2689 | 477 | 487 | 14 |         |       |

- Molecule 59 is a protein called 28S ribosomal protein S10, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 59  | AH    | 140      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2339  | 745 | 1187 | 194 | 210 | 3 |         |       |

- Molecule 60 is a protein called 28S ribosomal protein S12, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 60  | AJ    | 108      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1727  | 521 | 888 | 169 | 143 | 6 |         |       |

- Molecule 61 is a protein called 28S ribosomal protein S14, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 61  | AK    | 101      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1748  | 537 | 886 | 179 | 141 | 5 |         |       |

- Molecule 62 is a protein called 28S ribosomal protein S15, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 62  | AL    | 174      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2994  | 925 | 1541 | 270 | 251 | 7 |         |       |

- Molecule 63 is a protein called 28S ribosomal protein S16, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 63  | AM    | 119      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1908  | 594 | 966 | 185 | 157 | 6 |         |       |

- Molecule 64 is a protein called 28S ribosomal protein S17, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 64  | AN    | 110      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1797  | 562 | 929 | 156 | 147 | 3 |         |       |

- Molecule 65 is a protein called 28S ribosomal protein S18b, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 65  | AO    | 193      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 3149  | 1014 | 1557 | 294 | 277 | 7 |         |       |

- Molecule 66 is a protein called 28S ribosomal protein S18c, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 66  | AP    | 97       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1587  | 501 | 806 | 134 | 138 | 8 |         |       |

- Molecule 67 is a protein called 28S ribosomal protein S22, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 67  | AR    | 295      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 4839  | 1533 | 2430 | 413 | 455 | 8 |         |       |

- Molecule 68 is a protein called 28S ribosomal protein S23, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 68  | AS    | 135      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2227  | 716 | 1116 | 198 | 196 | 1 |         |       |

- Molecule 69 is a protein called 28S ribosomal protein S25, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|----|---------|-------|
| 69  | AT    | 168      | Total | C   | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 2764  | 877 | 1393 | 239 | 244 | 11 |         |       |

- Molecule 70 is a protein called 28S ribosomal protein S26, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 70  | AU    | 176      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2989  | 916 | 1501 | 301 | 267 | 4 |         |       |

- Molecule 71 is a protein called 28S ribosomal protein S27, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 71  | AV    | 362      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 5933  | 1904 | 2964 | 495 | 558 | 12 |         |       |

- Molecule 72 is a protein called 28S ribosomal protein S28, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 72  | AW    | 100      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1593  | 498 | 804 | 141 | 146 | 4 |         |       |

- Molecule 73 is a protein called 28S ribosomal protein S33, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 73  | AZ    | 100      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1698  | 534 | 859 | 153 | 148 | 4 |         |       |

- Molecule 74 is a protein called Small ribosomal subunit protein mS34.

| Mol | Chain | Residues | Atoms |      |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|---|---------|-------|
| 74  | A0    | 215      | Total | C    | H    | N   | O   | S | 0       | 0     |
|     |       |          | 3584  | 1130 | 1797 | 339 | 313 | 5 |         |       |

- Molecule 75 is a protein called 28S ribosomal protein S35, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 75  | A1    | 279      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 4561  | 1435 | 2296 | 387 | 432 | 11 |         |       |

- Molecule 76 is a protein called Aurora kinase A-interacting protein.

| Mol | Chain | Residues | Atoms |     |     |     |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---|---------|-------|
| 76  | A3    | 70       | Total | C   | H   | N   | O  | S | 0       | 0     |
|     |       |          | 1326  | 401 | 701 | 134 | 89 | 1 |         |       |

- Molecule 77 is a RNA chain called mRNA.

| Mol | Chain | Residues | Atoms |     |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|----|---------|-------|
| 77  | Az    | 34       | Total | C   | H   | N   | O   | P  | 0       | 0     |
|     |       |          | 1079  | 324 | 360 | 123 | 238 | 34 |         |       |

- Molecule 78 is a protein called 28S ribosomal protein S31, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 78  | AY    | 119      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1973  | 654 | 963 | 166 | 188 | 2 |         |       |

- Molecule 79 is a RNA chain called 12S mitochondrial rRNA.

| Mol | Chain | Residues | Atoms |      |      |      |     |  | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|-----|--|---------|-------|
| 79  | AA    | 954      | Total | C    | N    | O    | P   |  | 0       | 0     |
|     |       |          | 20260 | 9088 | 3647 | 6571 | 954 |  |         |       |

- Molecule 80 is a protein called 28S ribosomal protein S11, mitochondrial.

| Mol | Chain | Residues | Atoms |     |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|------|-----|-----|---|---------|-------|
| 80  | AI    | 137      | Total | C   | H    | N   | O   | S | 0       | 0     |
|     |       |          | 2077  | 641 | 1058 | 193 | 181 | 4 |         |       |

- Molecule 81 is a protein called Mitochondrial inner membrane protein OXA1L.

| Mol | Chain | Residues | Atoms |     |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|----|---|---------|-------|
| 81  | OX    | 55       | Total | C   | H   | N  | O  | S | 0       | 0     |
|     |       |          | 933   | 292 | 465 | 93 | 81 | 2 |         |       |

- Molecule 82 is a protein called 39S ribosomal protein L42, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 82  | a     | 103      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1695  | 543 | 830 | 155 | 162 | 5 |         |       |

- Molecule 83 is a RNA chain called P/P-tRNA.

| Mol | Chain | Residues | Atoms |     |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|----|---------|-------|
| 83  | Ax    | 71       | Total | C   | H   | N   | O   | P  | 0       | 0     |
|     |       |          | 2264  | 673 | 766 | 264 | 491 | 70 |         |       |

- Molecule 84 is a protein called Pentatricopeptide repeat domain-containing protein 3, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 84  | A4    | 588      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 9535  | 3053 | 4767 | 808 | 879 | 28 |         |       |

- Molecule 85 is a RNA chain called mitochondrial tRNA<sup>Val</sup>.

| Mol | Chain | Residues | Atoms |     |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|----|---------|-------|
| 85  | B     | 72       | Total | C   | H   | N   | O   | P  | 0       | 0     |
|     |       |          | 2304  | 685 | 780 | 269 | 498 | 72 |         |       |

- Molecule 86 is a protein called 28S ribosomal protein S29, mitochondrial.

| Mol | Chain | Residues | Atoms |      |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|-----|-----|----|---------|-------|
| 86  | AX    | 352      | Total | C    | H    | N   | O   | S  | 0       | 0     |
|     |       |          | 5693  | 1822 | 2844 | 499 | 517 | 11 |         |       |

- Molecule 87 is a protein called Small ribosomal subunit protein mS37.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 87  | A2    | 118      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1906  | 579 | 971 | 182 | 166 | 8 |         |       |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment     | Reference  |
|-------|---------|----------|--------|-------------|------------|
| A2    | 1       | ACE      | -      | acetylation | UNP Q96BP2 |

- Molecule 88 is a protein called Small ribosomal subunit protein bS21m.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 88  | AQ    | 87       | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1502  | 460 | 758 | 150 | 126 | 8 |         |       |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment     | Reference  |
|-------|---------|----------|--------|-------------|------------|
| AQ    | 1       | ACE      | -      | acetylation | UNP P82921 |
| AQ    | 50      | ARG      | CYS    | variant     | UNP P82921 |

- Molecule 89 is a protein called Large ribosomal subunit protein mL53.

| Mol | Chain | Residues | Atoms |     |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|-----|---|---------|-------|
| 89  | k     | 102      | Total | C   | H   | N   | O   | S | 0       | 0     |
|     |       |          | 1559  | 479 | 785 | 148 | 142 | 5 |         |       |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment     | Reference  |
|-------|---------|----------|--------|-------------|------------|
| k     | 1       | ACE      | -      | acetylation | UNP Q96EL3 |

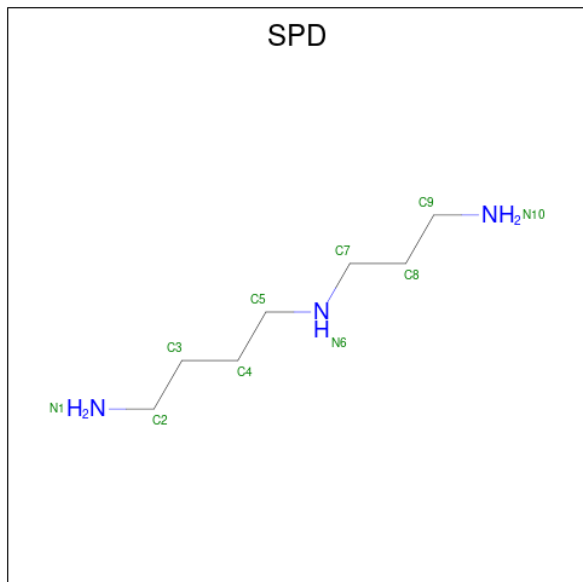
- Molecule 90 is ZINC ION (CCD ID: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 90  | 0     | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |
| 90  | 4     | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |
| 90  | AO    | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |

- Molecule 91 is POTASSIUM ION (CCD ID: K) (formula: K).

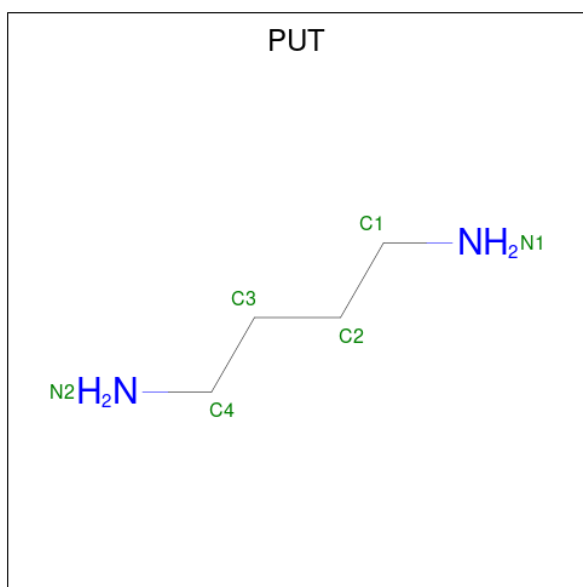
| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 91  | 6     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | A     | 29       | Total | K  | 0       |
|     |       |          | 29    | 29 |         |
| 91  | D     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | M     | 2        | Total | K  | 0       |
|     |       |          | 2     | 2  |         |
| 91  | N     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | W     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | o     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | AA    | 18       | Total | K  | 0       |
|     |       |          | 18    | 18 |         |

- Molecule 92 is SPERMIDINE (CCD ID: SPD) (formula:  $C_7H_{19}N_3$ ) (labeled as "Ligand of Interest" by depositor).



| Mol | Chain | Residues | Atoms |   |    |   | AltConf |
|-----|-------|----------|-------|---|----|---|---------|
| 92  | A     | 1        | Total | C | H  | N | 0       |
|     |       |          | 32    | 7 | 22 | 3 |         |
| 92  | A     | 1        | Total | C | H  | N | 0       |
|     |       |          | 32    | 7 | 22 | 3 |         |
| 92  | A     | 1        | Total | C | N  |   | 0       |
|     |       |          | 10    | 7 | 3  |   |         |
| 92  | A     | 1        | Total | C | N  |   | 0       |
|     |       |          | 10    | 7 | 3  |   |         |
| 92  | A     | 1        | Total | C | N  |   | 0       |
|     |       |          | 10    | 7 | 3  |   |         |
| 92  | AG    | 1        | Total | C | N  |   | 0       |
|     |       |          | 10    | 7 | 3  |   |         |
| 92  | AA    | 1        | Total | C | N  |   | 0       |
|     |       |          | 10    | 7 | 3  |   |         |
| 92  | AA    | 1        | Total | C | N  |   | 0       |
|     |       |          | 10    | 7 | 3  |   |         |

- Molecule 93 is 1,4-DIAMINOBUTANE (CCD ID: PUT) (formula:  $C_4H_{12}N_2$ ).

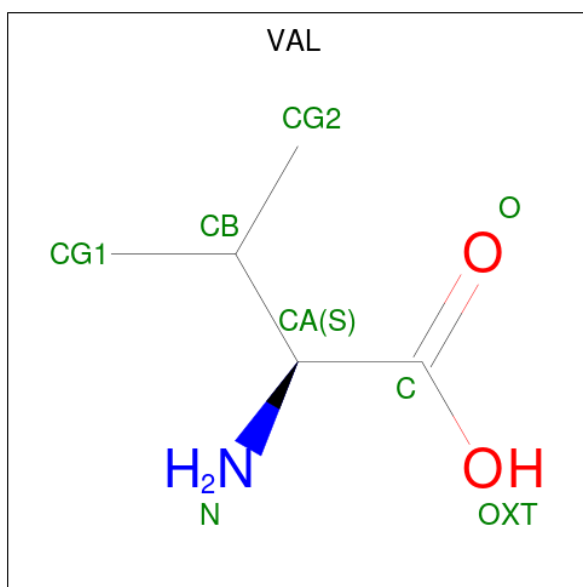


| Mol | Chain | Residues | Atoms |   |    |   | AltConf |
|-----|-------|----------|-------|---|----|---|---------|
| 93  | A     | 1        | Total | C | H  | N | 0       |
|     |       |          | 20    | 4 | 14 | 2 |         |

- Molecule 94 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

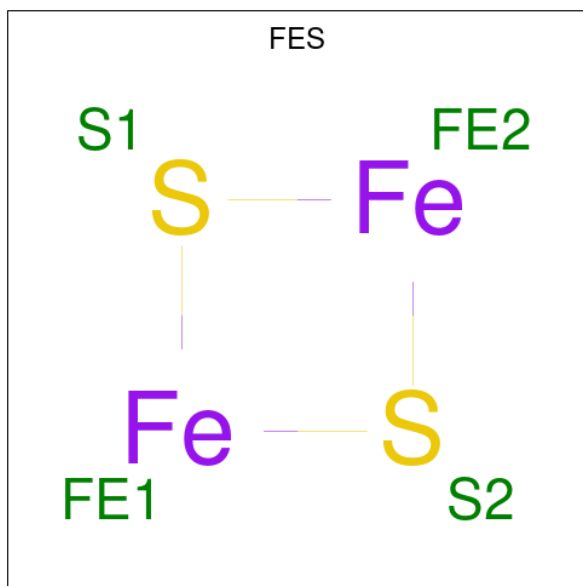
| Mol | Chain | Residues | Atoms |     | AltConf |
|-----|-------|----------|-------|-----|---------|
| 94  | A     | 136      | Total | Mg  | 0       |
|     |       |          | 136   | 136 |         |
| 94  | D     | 2        | Total | Mg  | 0       |
|     |       |          | 2     | 2   |         |
| 94  | E     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 94  | I     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 94  | g     | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 94  | AB    | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 94  | A3    | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |
| 94  | AA    | 61       | Total | Mg  | 0       |
|     |       |          | 61    | 61  |         |
| 94  | AX    | 1        | Total | Mg  | 0       |
|     |       |          | 1     | 1   |         |

- Molecule 95 is VALINE (CCD ID: VAL) (formula: C<sub>5</sub>H<sub>11</sub>NO<sub>2</sub>).



| Mol | Chain | Residues | Atoms |   |   |   |   | AltConf |
|-----|-------|----------|-------|---|---|---|---|---------|
| 95  | e     | 1        | Total | C | H | N | O | 0       |
|     |       |          | 15    | 5 | 8 | 1 | 1 |         |

- Molecule 96 is FE2/S2 (INORGANIC) CLUSTER (CCD ID: FES) (formula:  $\text{Fe}_2\text{S}_2$ ) (labeled as "Ligand of Interest" by depositor).



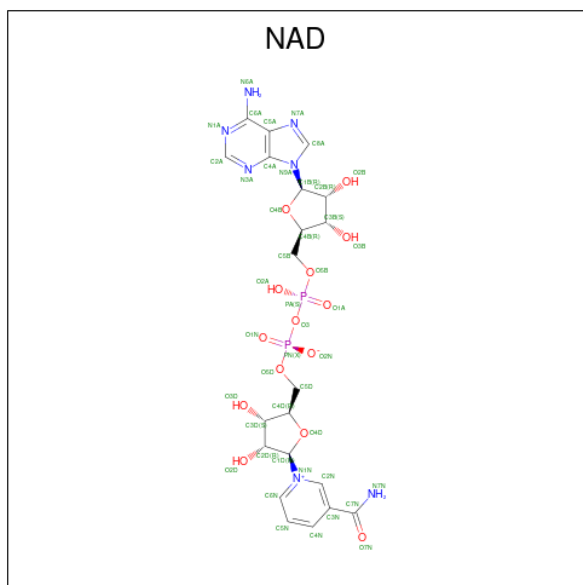
| Mol | Chain | Residues | Atoms |    |   | AltConf |
|-----|-------|----------|-------|----|---|---------|
| 96  | r     | 1        | Total | Fe | S | 0       |
|     |       |          | 4     | 2  | 2 |         |
| 96  | AP    | 1        | Total | Fe | S | 0       |
|     |       |          | 4     | 2  | 2 |         |

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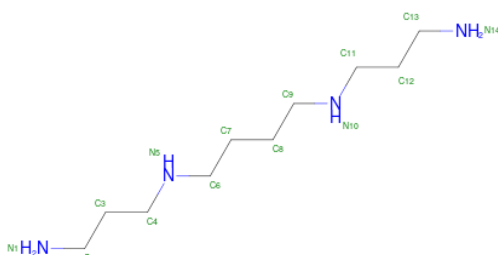
| Mol | Chain | Residues | Atoms |    |   | AltConf |
|-----|-------|----------|-------|----|---|---------|
| 96  | AT    | 1        | Total | Fe | S | 0       |
|     |       |          | 4     | 2  | 2 |         |

- Molecule 97 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (CCD ID: NAD) (formula:  $C_{21}H_{27}N_7O_{14}P_2$ ) (labeled as "Ligand of Interest" by depositor).



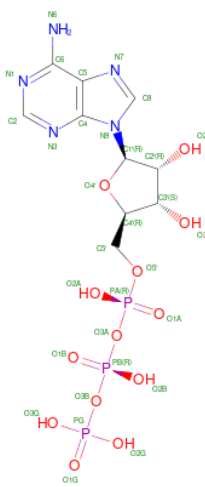
| Mol | Chain | Residues | Atoms |    |   |    |   | AltConf |
|-----|-------|----------|-------|----|---|----|---|---------|
| 97  | AA    | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 44    | 21 | 7 | 14 | 2 |         |

- Molecule 98 is SPERMINE (CCD ID: SPM) (formula:  $C_{10}H_{26}N_4$ ) (labeled as "Ligand of Interest" by depositor).



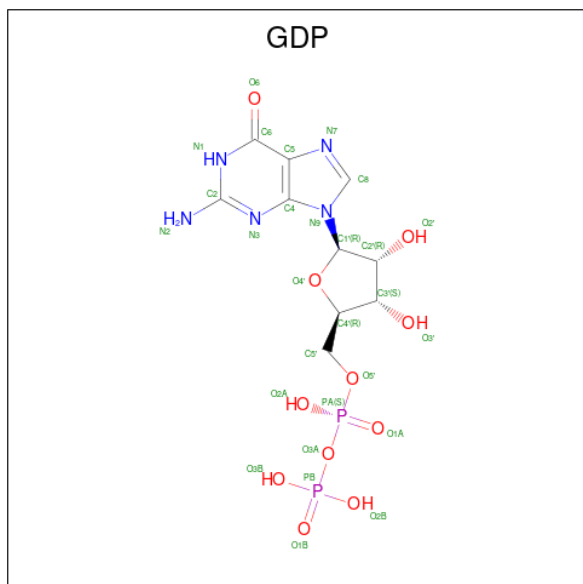
| Mol | Chain | Residues | Atoms       |         |        | AltConf |
|-----|-------|----------|-------------|---------|--------|---------|
| 98  | AA    | 1        | Total<br>14 | C<br>10 | N<br>4 | 0       |
| 98  | AA    | 1        | Total<br>14 | C<br>10 | N<br>4 | 0       |
| 98  | AA    | 1        | Total<br>14 | C<br>10 | N<br>4 | 0       |

- Molecule 99 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula:  $C_{10}H_{16}N_5O_{13}P_3$ ) (labeled as "Ligand of Interest" by depositor).



| Mol | Chain | Residues | Atoms |    |    |   |    | AltConf |   |
|-----|-------|----------|-------|----|----|---|----|---------|---|
| 99  | AX    | 1        | Total | C  | H  | N | O  | P       | 0 |
|     |       |          | 42    | 10 | 11 | 5 | 13 | 3       |   |

- Molecule 100 is GUANOSINE-5'-DIPHOSPHATE (CCD ID: GDP) (formula:  $\text{C}_{10}\text{H}_{15}\text{N}_5\text{O}_{11}\text{P}_2$ ) (labeled as "Ligand of Interest" by depositor).

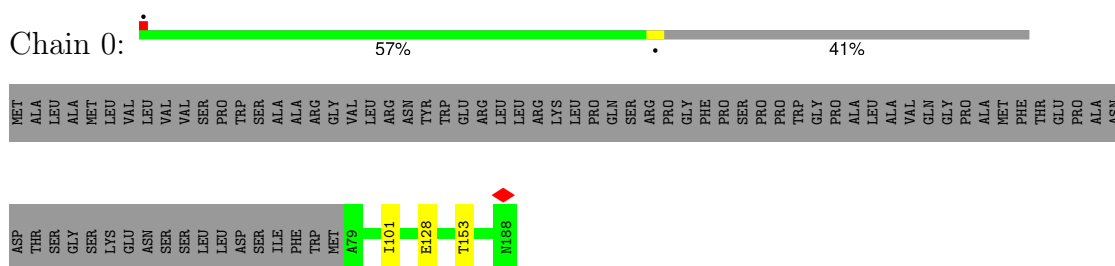


| Mol | Chain | Residues | Atoms |    |    |   |    |   | AltConf |
|-----|-------|----------|-------|----|----|---|----|---|---------|
| 100 | AX    | 1        | Total | C  | H  | N | O  | P | 0       |
|     |       |          | 40    | 10 | 12 | 5 | 11 | 2 |         |

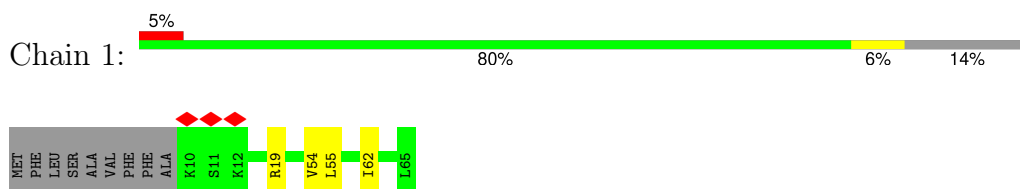
### 3 Residue-property plots [i](#)

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 and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

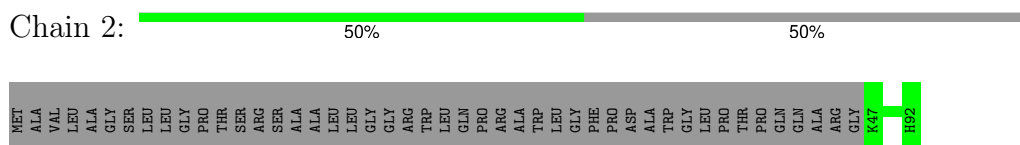
- Molecule 1: 39S ribosomal protein L32, mitochondrial



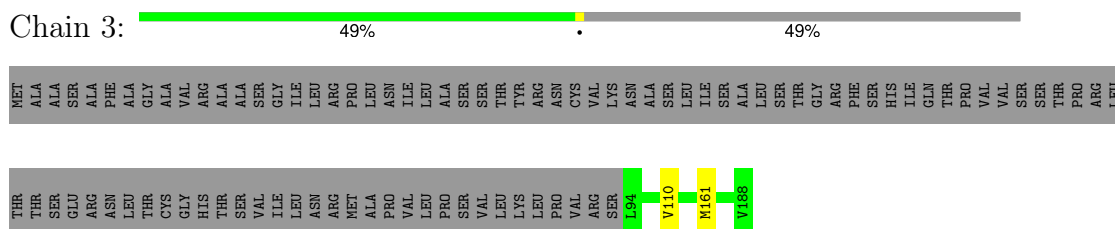
- Molecule 2: 39S ribosomal protein L33, mitochondrial



- Molecule 3: 39S ribosomal protein L34, mitochondrial

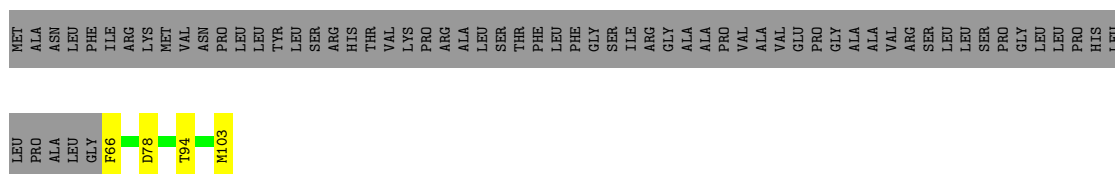


- Molecule 4: 39S ribosomal protein L35, mitochondrial



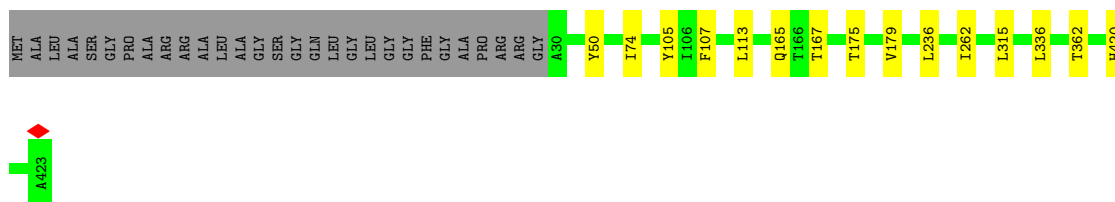
- Molecule 5: 39S ribosomal protein L36, mitochondrial





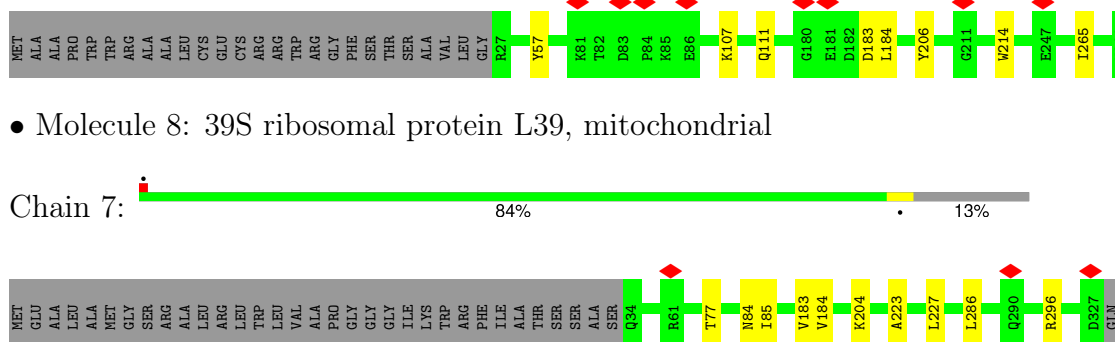
- Molecule 6: 39S ribosomal protein L37, mitochondrial

Chain 5:



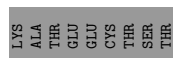
- Molecule 7: 39S ribosomal protein L38, mitochondrial

Chain 6:



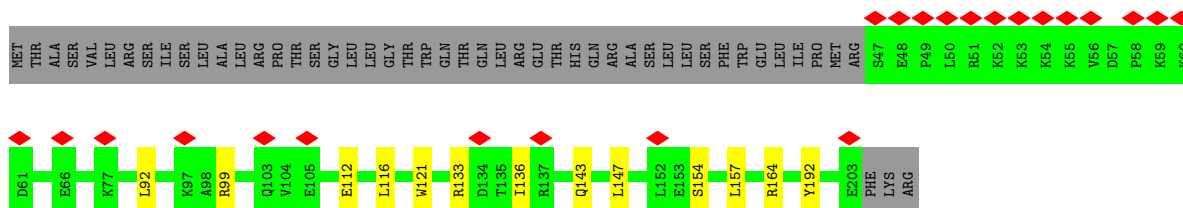
- Molecule 8: 39S ribosomal protein L39, mitochondrial

Chain 7:



- Molecule 9: 39S ribosomal protein L40, mitochondrial

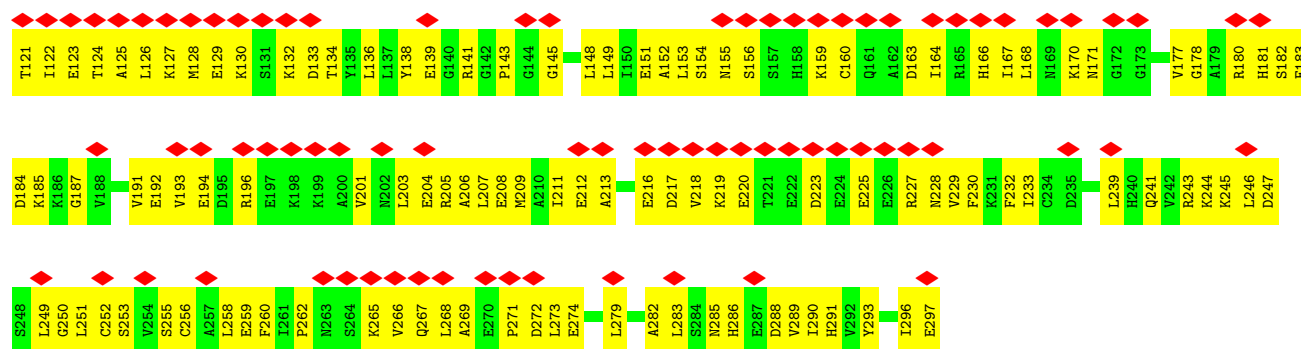
Chain 8:



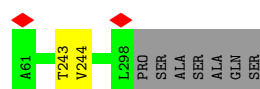
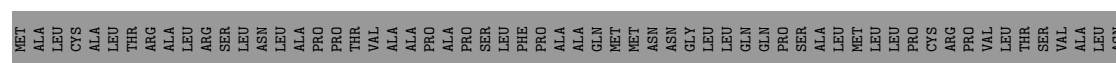
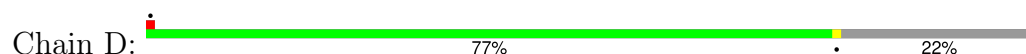
- Molecule 10: 39S ribosomal protein L41, mitochondrial

Chain 9:

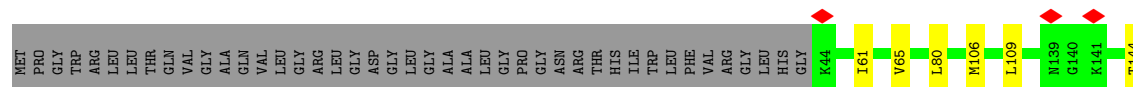
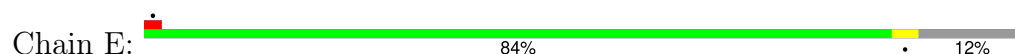




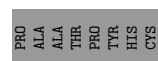
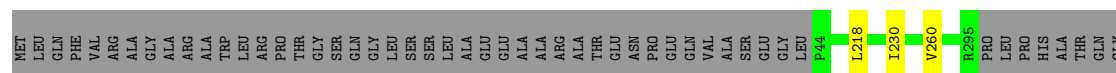
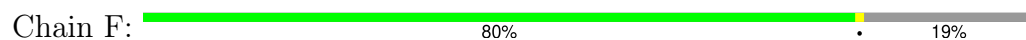
- Molecule 13: 39S ribosomal protein L2, mitochondrial



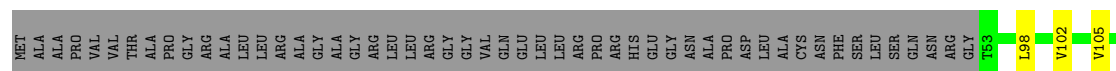
- Molecule 14: 39S ribosomal protein L3, mitochondrial

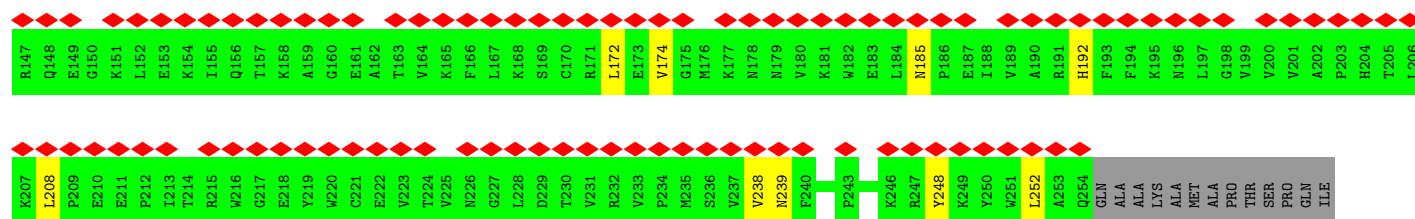


- Molecule 15: 39S ribosomal protein L4, mitochondrial



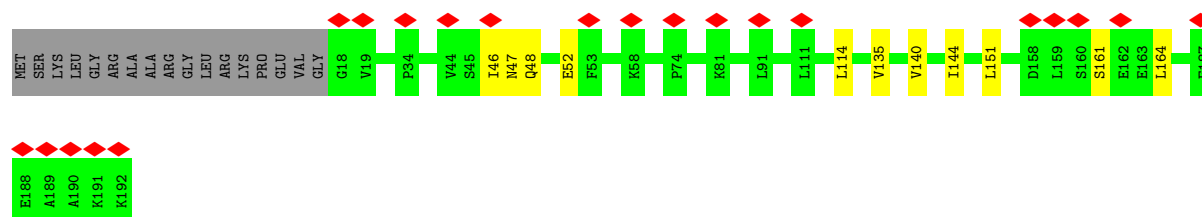
- Molecule 16: 39S ribosomal protein L9, mitochondrial





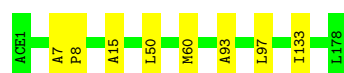
- Molecule 17: 39S ribosomal protein L11, mitochondrial

Chain J: 11% 85% 6% 9%



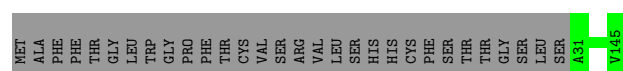
- Molecule 18: Large ribosomal subunit protein uL13m

Chain K: 96% 4%



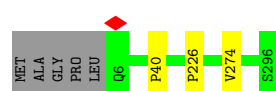
- Molecule 19: 39S ribosomal protein L14, mitochondrial

Chain L: 79% 21%



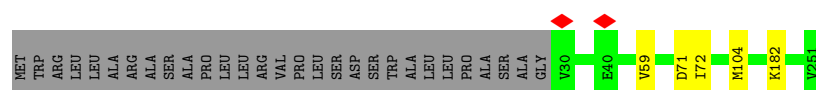
- Molecule 20: 39S ribosomal protein L15, mitochondrial

Chain M: 97% 3%

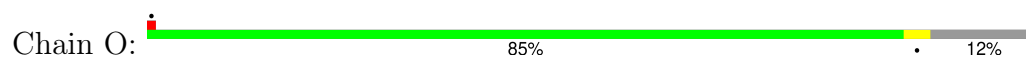


- Molecule 21: 39S ribosomal protein L16, mitochondrial

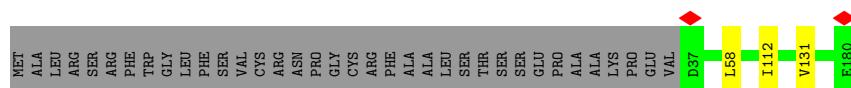
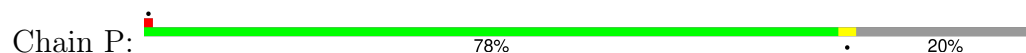
Chain N: 86% 12% 2%



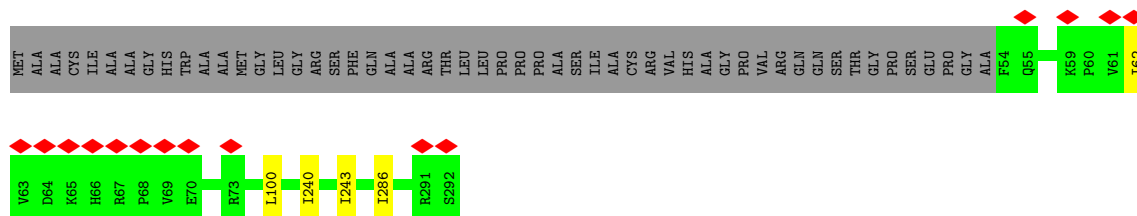
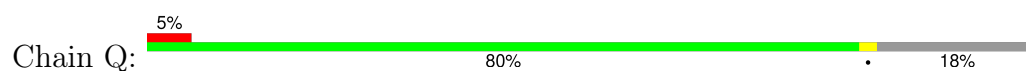
- Molecule 22: 39S ribosomal protein L17, mitochondrial



- Molecule 23: 39S ribosomal protein L18, mitochondrial



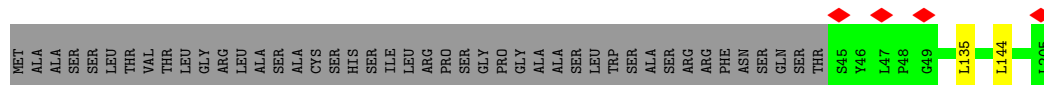
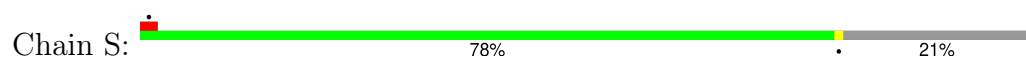
- Molecule 24: 39S ribosomal protein L19, mitochondrial



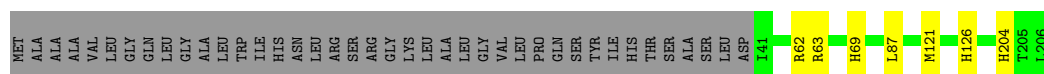
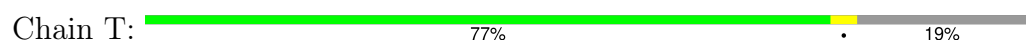
- Molecule 25: 39S ribosomal protein L20, mitochondrial



- Molecule 26: 39S ribosomal protein L21, mitochondrial

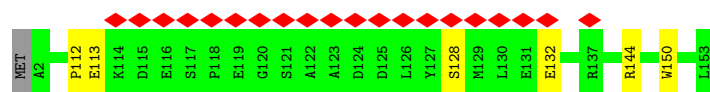


- Molecule 27: 39S ribosomal protein L22, mitochondrial

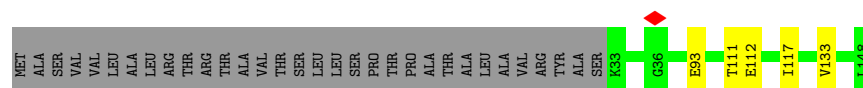
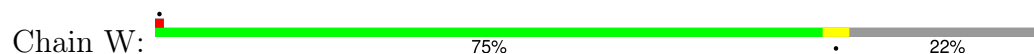


- Molecule 28: 39S ribosomal protein L23, mitochondrial

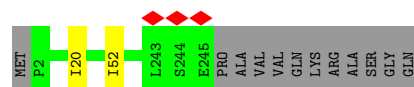




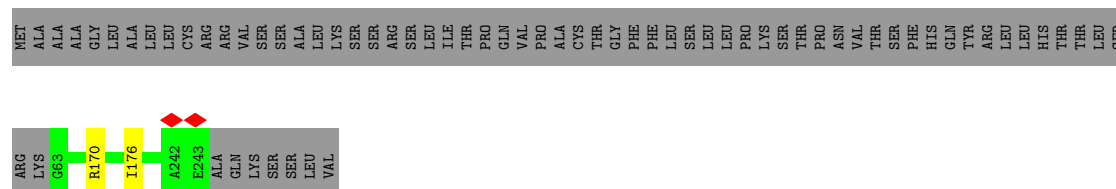
- Molecule 29: 39S ribosomal protein L27, mitochondrial



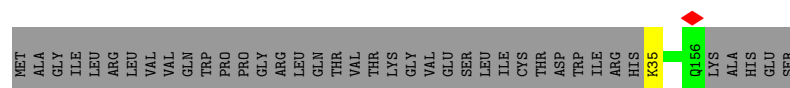
- Molecule 30: 39S ribosomal protein L28, mitochondrial



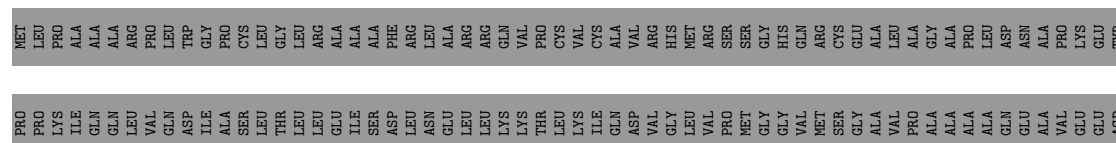
- Molecule 31: 39S ribosomal protein L47, mitochondrial



- Molecule 32: 39S ribosomal protein L30, mitochondrial

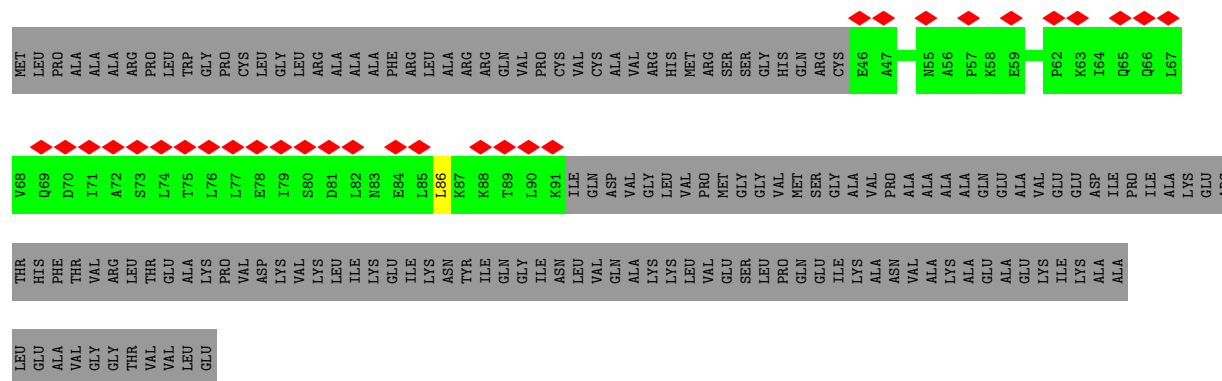


- Molecule 33: 39S ribosomal protein L12, mitochondrial

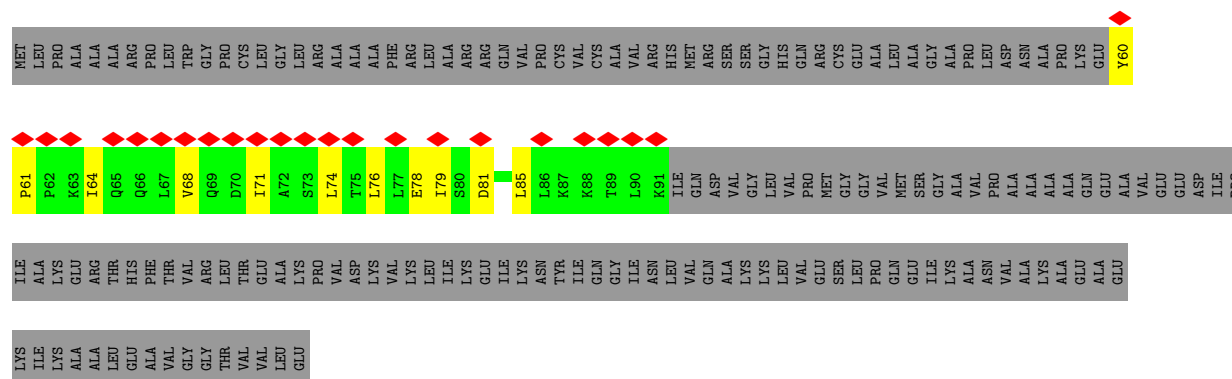




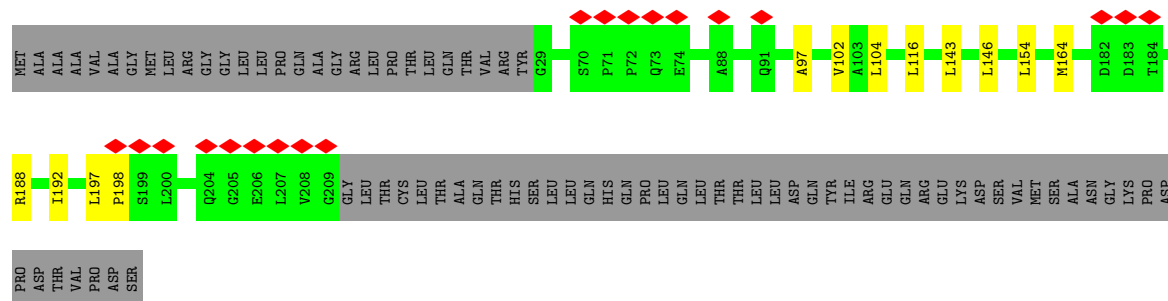
- Molecule 33: 39S ribosomal protein L12, mitochondrial



- Molecule 33: 39S ribosomal protein L12, mitochondrial

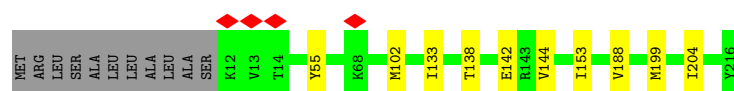


- Molecule 34: 39S ribosomal protein L10, mitochondrial



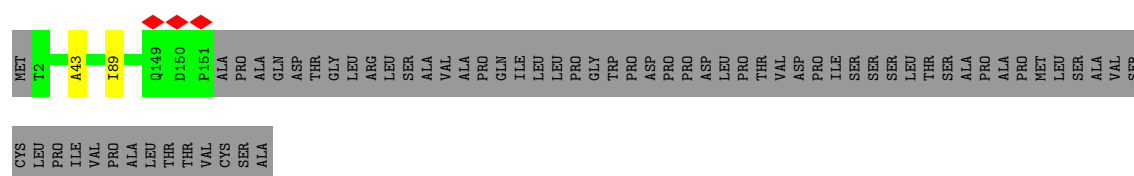
- Molecule 35: 39S ribosomal protein L24, mitochondrial

Chain V: 



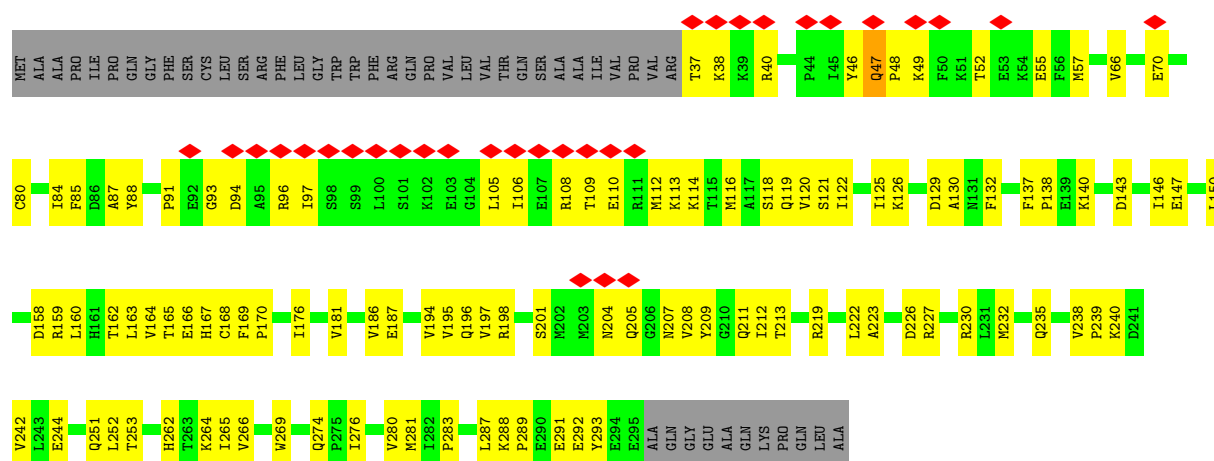
- Molecule 36: 39S ribosomal protein L43, mitochondrial

Chain b: 



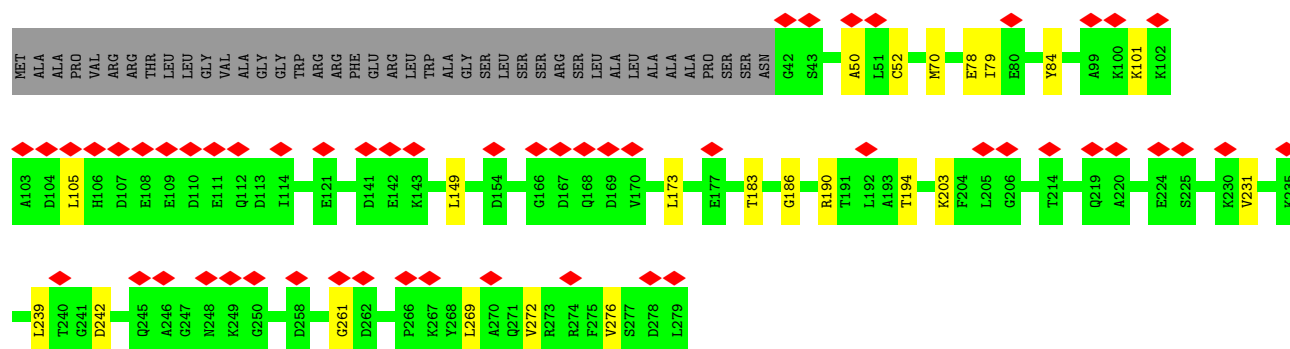
- Molecule 37: 39S ribosomal protein L45, mitochondrial

Chain d: 

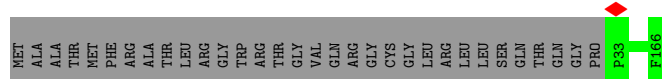
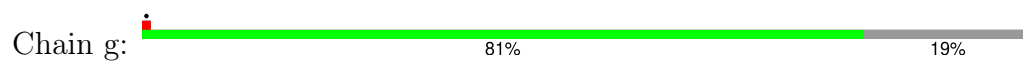


- Molecule 38: 39S ribosomal protein L46, mitochondrial

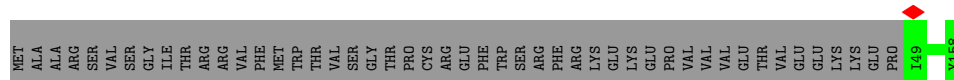
Chain e: 



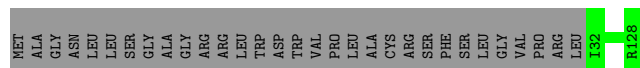
- Molecule 39: 39S ribosomal protein L49, mitochondrial



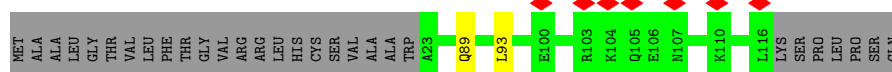
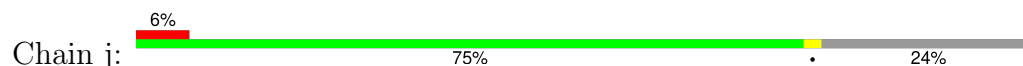
- Molecule 40: 39S ribosomal protein L50, mitochondrial



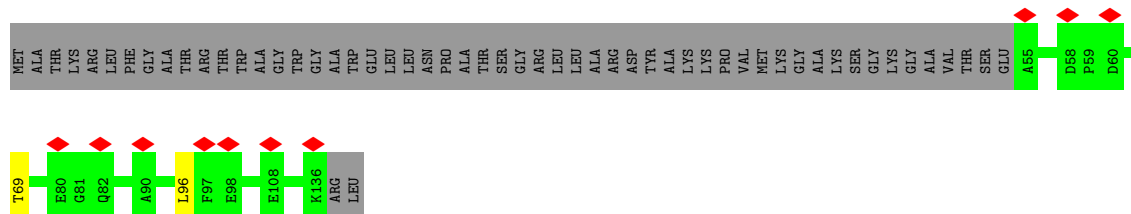
- Molecule 41: 39S ribosomal protein L51, mitochondrial



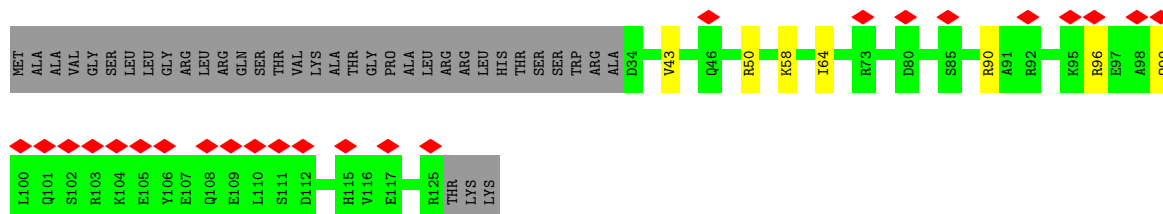
- Molecule 42: 39S ribosomal protein L52, mitochondrial



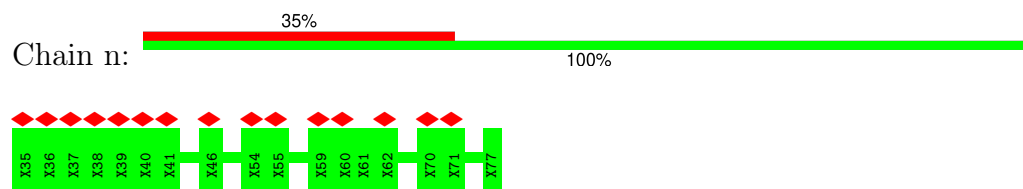
- Molecule 43: 39S ribosomal protein L54, mitochondrial



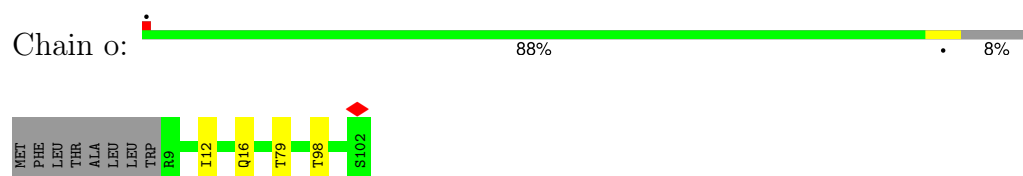
- Molecule 44: 39S ribosomal protein L55, mitochondrial



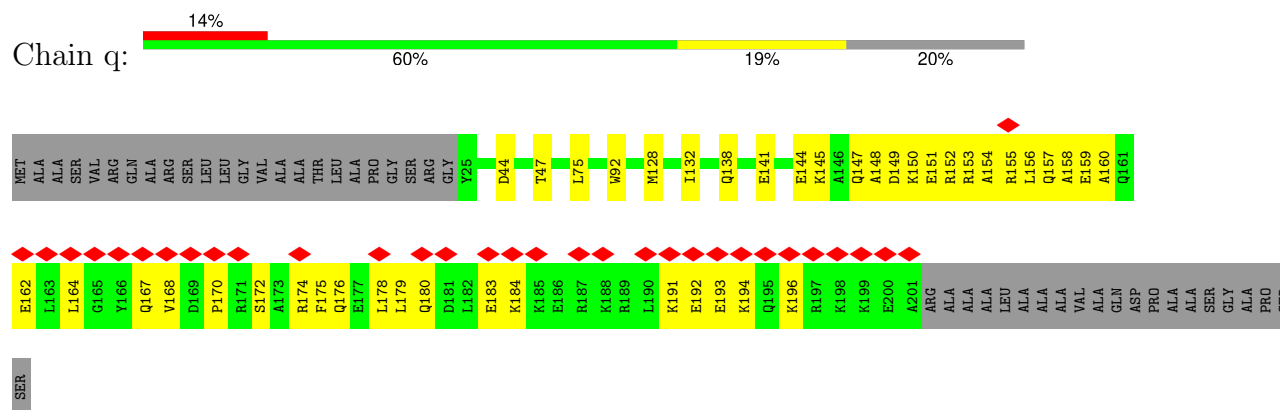
- Molecule 45: Nascent polypeptide



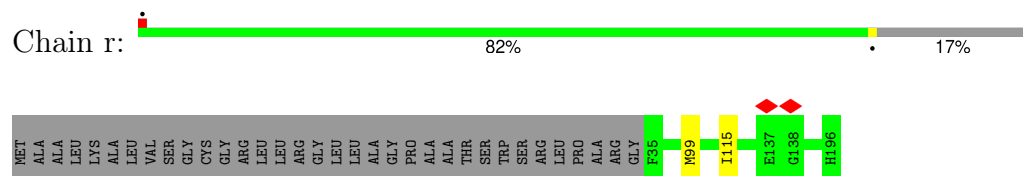
- Molecule 46: Ribosomal protein 63, mitochondrial



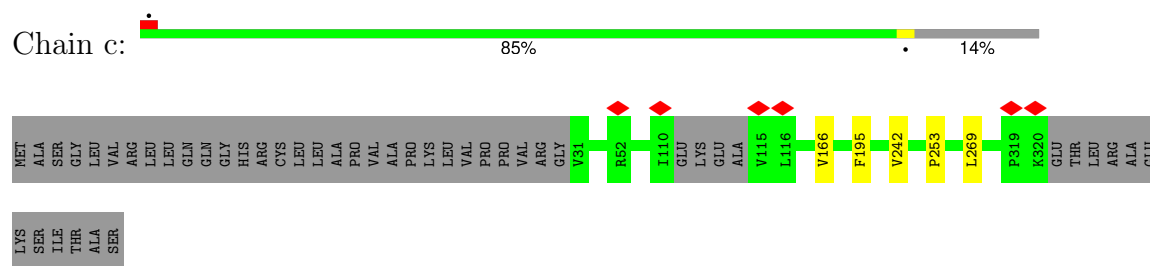
- Molecule 47: Growth arrest and DNA damage-inducible proteins-interacting protein 1



- Molecule 48: 39S ribosomal protein S18a, mitochondrial

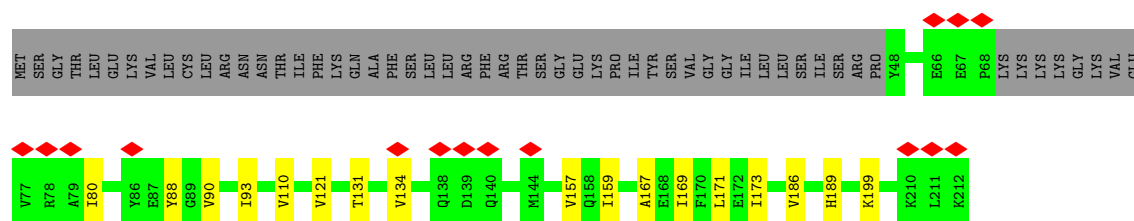


- Molecule 49: 39S ribosomal protein L44, mitochondrial

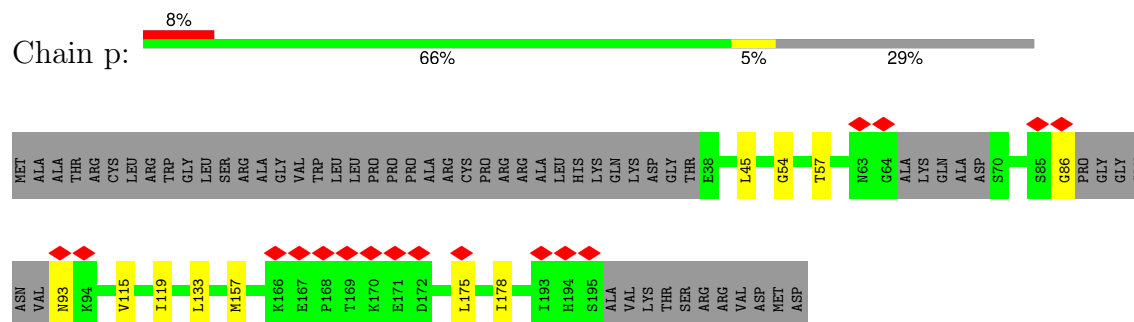


- Molecule 50: 39S ribosomal protein L48, mitochondrial

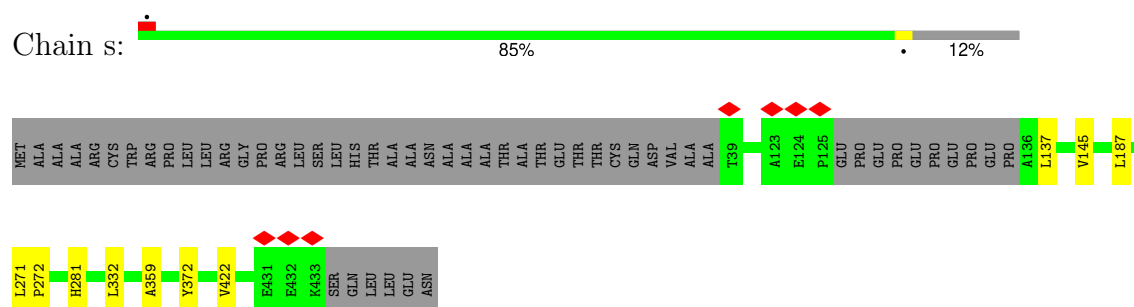




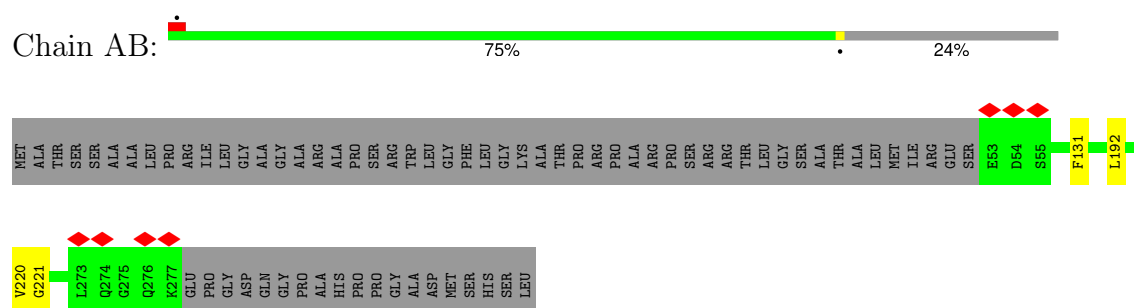
- Molecule 51: Peptidyl-tRNA hydrolase ICT1, mitochondrial



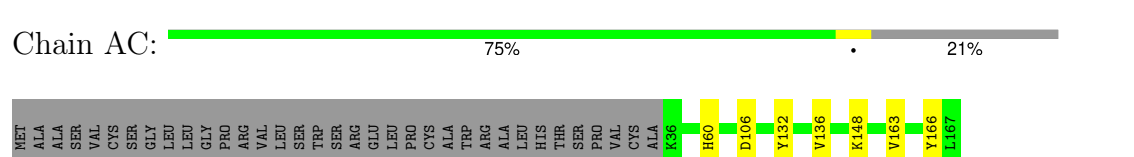
- Molecule 52: 39S ribosomal protein S30, mitochondrial



- Molecule 53: 28S ribosomal protein S2, mitochondrial



- Molecule 54: 28S ribosomal protein S24, mitochondrial

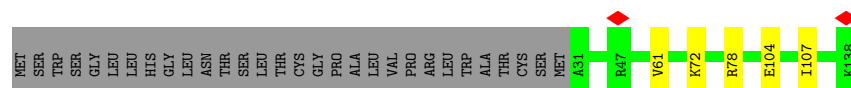
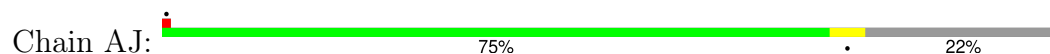


- Molecule 55: 28S ribosomal protein S5, mitochondrial

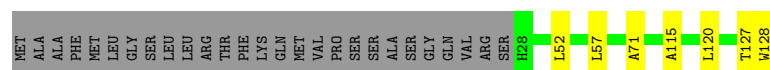
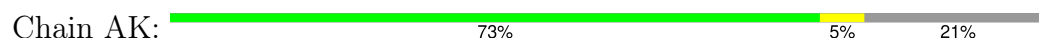




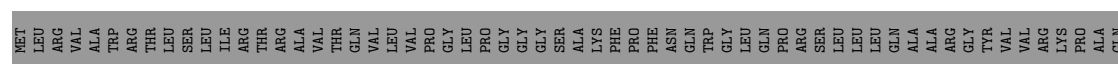
- Molecule 60: 28S ribosomal protein S12, mitochondrial



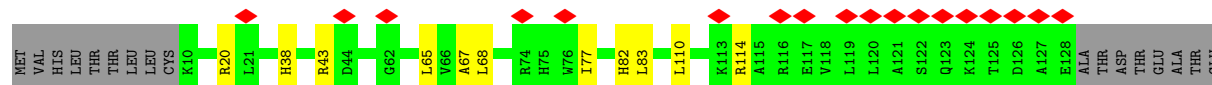
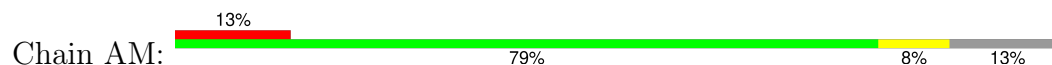
- Molecule 61: 28S ribosomal protein S14, mitochondrial



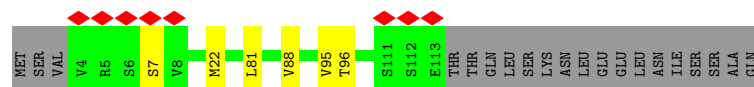
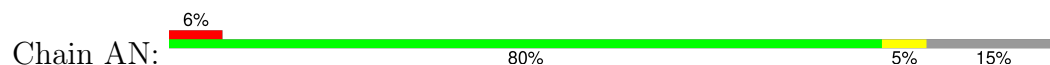
- Molecule 62: 28S ribosomal protein S15, mitochondrial



- Molecule 63: 28S ribosomal protein S16, mitochondrial

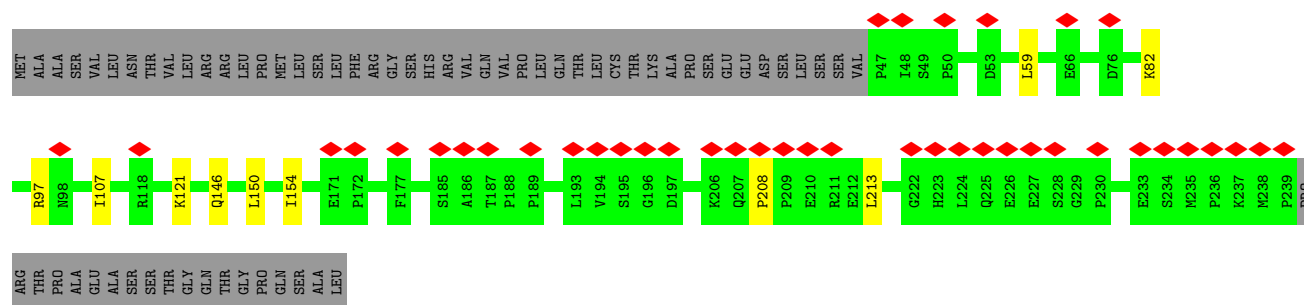


- Molecule 64: 28S ribosomal protein S17, mitochondrial

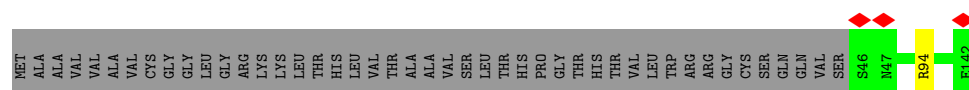


- Molecule 65: 28S ribosomal protein S18b, mitochondrial

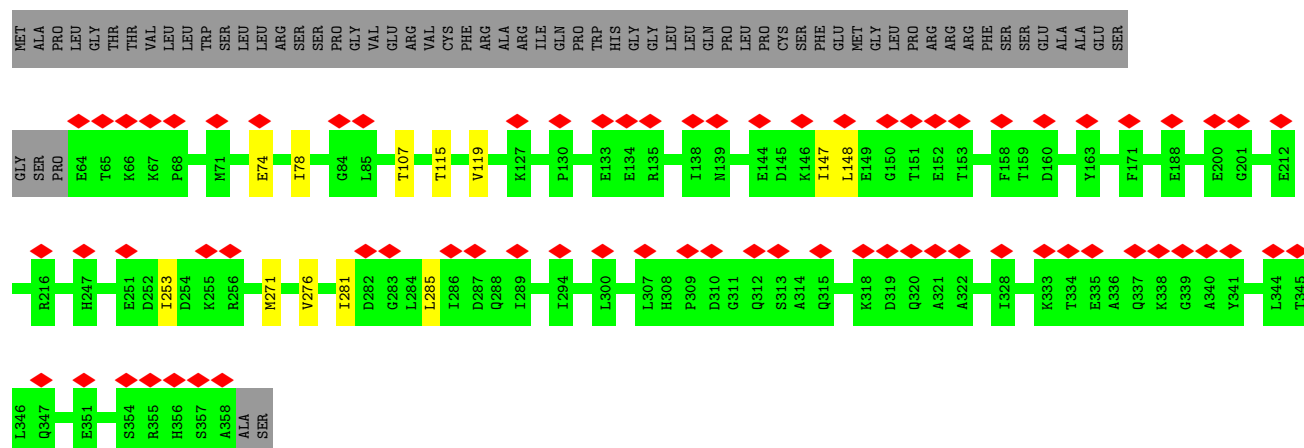
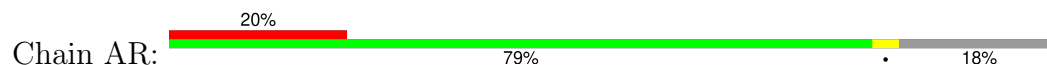




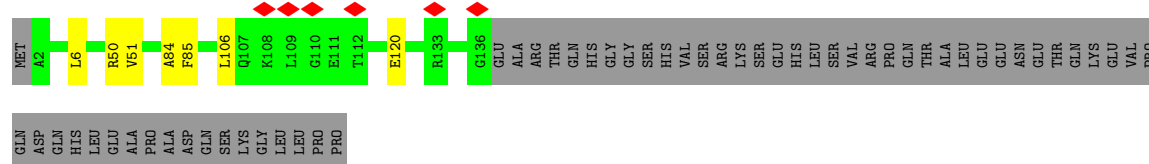
- Molecule 66: 28S ribosomal protein S18c, mitochondrial



- Molecule 67: 28S ribosomal protein S22, mitochondrial



- Molecule 68: 28S ribosomal protein S23, mitochondrial



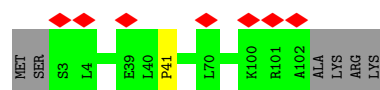
- Molecule 69: 28S ribosomal protein S25, mitochondrial



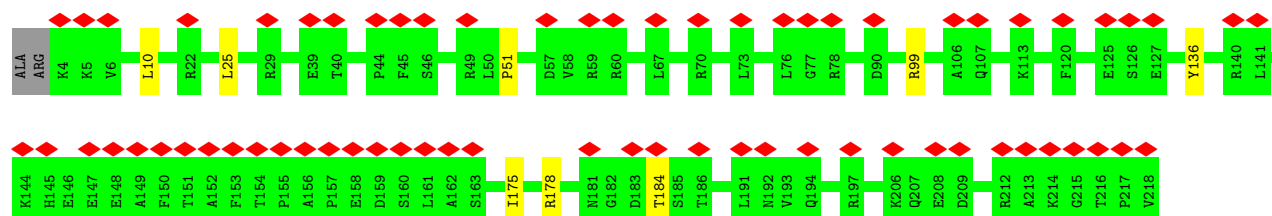




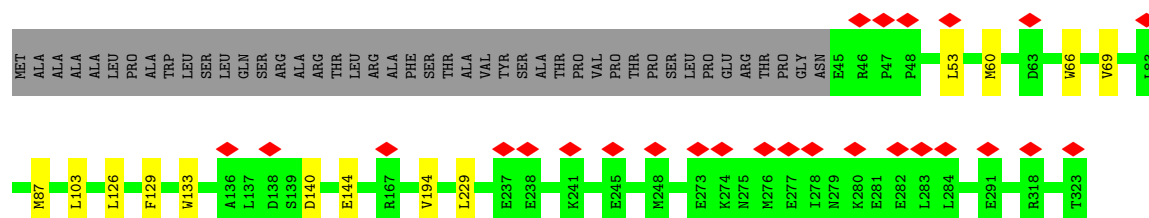
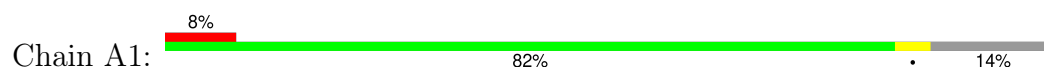
- Molecule 73: 28S ribosomal protein S33, mitochondrial



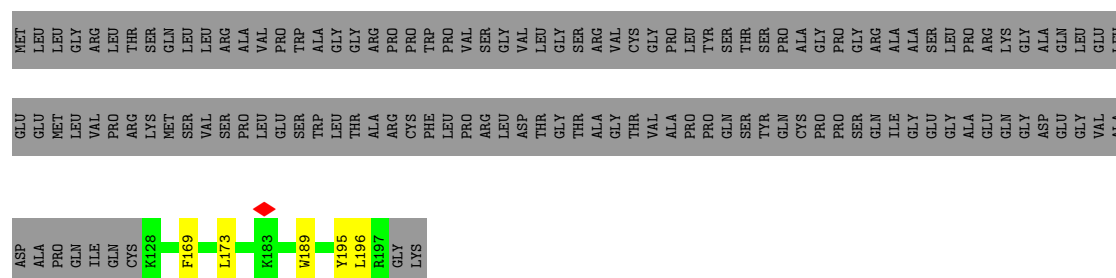
- Molecule 74: Small ribosomal subunit protein mS34



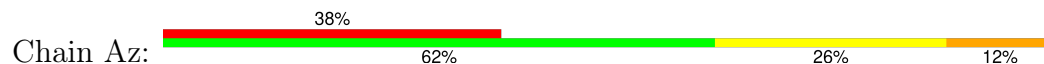
- Molecule 75: 28S ribosomal protein S35, mitochondrial



- Molecule 76: Aurora kinase A-interacting protein



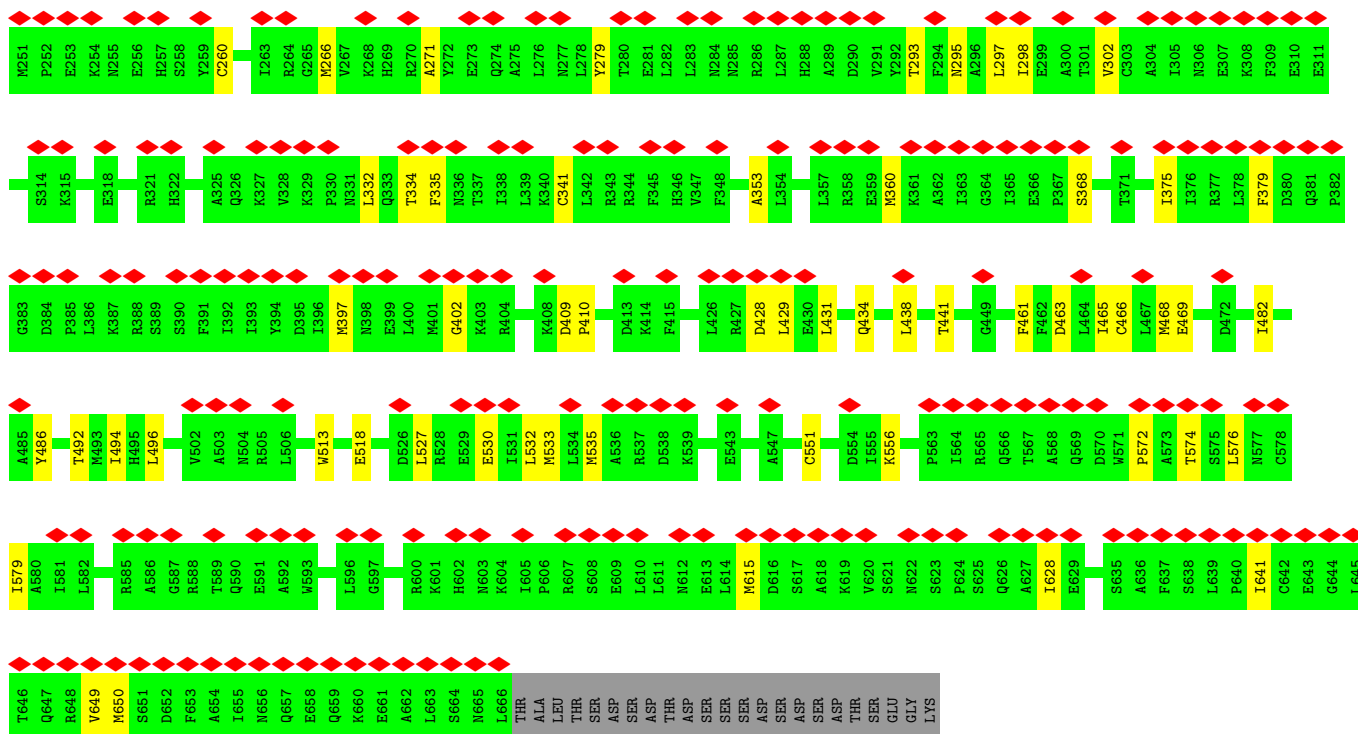
- Molecule 77: mRNA







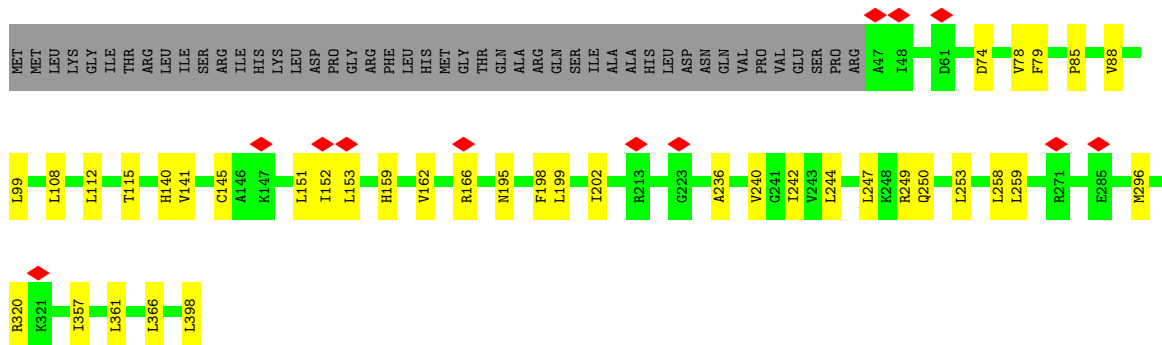
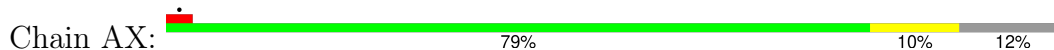




• Molecule 85: mitochondrial tRNA<sup>Val</sup>



• Molecule 86: 28S ribosomal protein S29, mitochondrial



• Molecule 87: Small ribosomal subunit protein mS37



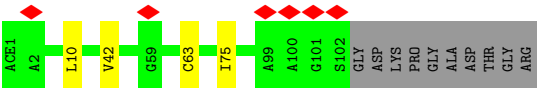
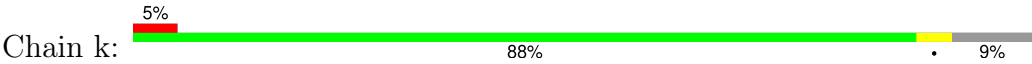


- Molecule 88: Small ribosomal subunit protein bS21m



There are no outlier residues recorded for this chain.

- Molecule 89: Large ribosomal subunit protein mL53



## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 133433                                  | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | TFS KRIOS                               | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 55                                      | Depositor |
| Minimum defocus (nm)                 | 1000                                    | Depositor |
| Maximum defocus (nm)                 | 4000                                    | Depositor |
| Magnification                        | Not provided                            |           |
| Image detector                       | GATAN K3 (6k x 4k)                      | Depositor |
| Maximum map value                    | 0.531                                   | Depositor |
| Minimum map value                    | -0.242                                  | Depositor |
| Average map value                    | 0.000                                   | Depositor |
| Map value standard deviation         | 0.019                                   | Depositor |
| Recommended contour level            | 0.05                                    | Depositor |
| Map size (Å)                         | 512.63995, 512.63995, 512.63995         | wwPDB     |
| Map dimensions                       | 480, 480, 480                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 1.068, 1.068, 1.068                     | Depositor |

## 5 Model quality

### 5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: PSU, NAD, SPD, OMG, 5MC, ZN, 2MG, ACE, B8T, SPM, PUT, OMU, 5MU, MG, K, 1MA, MA6, GDP, FES, ATP

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   | 0     | 0.25         | 0/913       | 0.28        | 0/1224      |
| 2   | 1     | 0.21         | 0/469       | 0.29        | 0/621       |
| 3   | 2     | 0.31         | 0/383       | 0.29        | 0/507       |
| 4   | 3     | 0.30         | 0/853       | 0.29        | 0/1136      |
| 5   | 4     | 0.27         | 0/350       | 0.27        | 0/461       |
| 6   | 5     | 0.23         | 0/3305      | 0.29        | 0/4502      |
| 7   | 6     | 0.21         | 0/3043      | 0.29        | 0/4140      |
| 8   | 7     | 0.20         | 0/2447      | 0.27        | 0/3310      |
| 9   | 8     | 0.15         | 0/1354      | 0.31        | 0/1819      |
| 10  | 9     | 0.23         | 0/1025      | 0.28        | 0/1379      |
| 11  | A     | 0.30         | 0/36876     | 0.29        | 0/57402     |
| 12  | C     | 0.10         | 0/1754      | 0.24        | 0/2357      |
| 13  | D     | 0.25         | 0/1896      | 0.29        | 0/2549      |
| 14  | E     | 0.25         | 0/2475      | 0.30        | 0/3355      |
| 15  | F     | 0.27         | 0/2090      | 0.30        | 0/2842      |
| 16  | H     | 0.15         | 0/1698      | 0.25        | 0/2292      |
| 17  | J     | 0.13         | 0/1348      | 0.27        | 0/1813      |
| 18  | K     | 0.27         | 0/1497      | 0.29        | 0/2031      |
| 19  | L     | 0.24         | 0/905       | 0.30        | 0/1218      |
| 20  | M     | 0.26         | 0/2381      | 0.29        | 0/3212      |
| 21  | N     | 0.25         | 0/1833      | 0.29        | 0/2468      |
| 22  | O     | 0.26         | 0/1283      | 0.30        | 0/1727      |
| 23  | P     | 0.22         | 0/1199      | 0.28        | 0/1623      |
| 24  | Q     | 0.23         | 0/2039      | 0.27        | 0/2750      |
| 25  | R     | 0.29         | 0/1175      | 0.28        | 0/1572      |
| 26  | S     | 0.27         | 0/1320      | 0.30        | 0/1789      |
| 27  | T     | 0.28         | 0/1403      | 0.30        | 0/1886      |
| 28  | U     | 0.25         | 0/1279      | 0.32        | 0/1730      |
| 29  | W     | 0.27         | 0/926       | 0.31        | 0/1244      |
| 30  | X     | 0.23         | 0/2099      | 0.25        | 0/2837      |
| 31  | Y     | 0.26         | 0/1593      | 0.26        | 0/2136      |

| Mol | Chain | Bond lengths |         | Bond angles |         |
|-----|-------|--------------|---------|-------------|---------|
|     |       | RMSZ         | # Z  >5 | RMSZ        | # Z  >5 |
| 32  | Z     | 0.27         | 0/1021  | 0.29        | 0/1378  |
| 33  | G     | 0.10         | 0/562   | 0.32        | 0/754   |
| 33  | t     | 0.12         | 0/358   | 0.29        | 0/486   |
| 33  | u     | 0.15         | 0/259   | 0.32        | 0/350   |
| 34  | I     | 0.18         | 0/1478  | 0.31        | 0/1999  |
| 35  | V     | 0.20         | 0/1721  | 0.28        | 0/2333  |
| 36  | b     | 0.26         | 0/1218  | 0.28        | 0/1649  |
| 37  | d     | 0.18         | 0/2181  | 0.27        | 0/2949  |
| 38  | e     | 0.12         | 0/1970  | 0.26        | 0/2658  |
| 39  | g     | 0.26         | 0/1151  | 0.28        | 0/1569  |
| 40  | h     | 0.19         | 0/918   | 0.24        | 0/1249  |
| 41  | i     | 0.29         | 0/850   | 0.27        | 0/1135  |
| 42  | j     | 0.25         | 0/760   | 0.27        | 0/1023  |
| 43  | l     | 0.14         | 0/707   | 0.27        | 0/960   |
| 44  | m     | 0.13         | 0/805   | 0.27        | 0/1081  |
| 46  | o     | 0.27         | 0/819   | 0.29        | 0/1097  |
| 47  | q     | 0.18         | 0/1529  | 0.26        | 0/2055  |
| 48  | r     | 0.23         | 0/1362  | 0.28        | 0/1846  |
| 49  | c     | 0.23         | 0/2347  | 0.26        | 0/3171  |
| 50  | f     | 0.17         | 0/1273  | 0.30        | 0/1716  |
| 51  | p     | 0.19         | 0/1223  | 0.28        | 0/1641  |
| 52  | s     | 0.25         | 0/3231  | 0.29        | 0/4389  |
| 53  | AB    | 0.18         | 0/1871  | 0.25        | 0/2531  |
| 54  | AC    | 0.17         | 0/1113  | 0.27        | 0/1505  |
| 55  | AD    | 0.17         | 0/2783  | 0.26        | 0/3724  |
| 56  | AE    | 0.19         | 0/989   | 0.29        | 0/1335  |
| 57  | AF    | 0.15         | 0/1767  | 0.24        | 0/2373  |
| 58  | AG    | 0.16         | 0/2746  | 0.25        | 0/3681  |
| 59  | AH    | 0.16         | 0/1178  | 0.28        | 0/1598  |
| 60  | AJ    | 0.15         | 0/855   | 0.28        | 0/1148  |
| 61  | AK    | 0.16         | 0/880   | 0.25        | 0/1182  |
| 62  | AL    | 0.17         | 0/1477  | 0.24        | 0/1974  |
| 63  | AM    | 0.13         | 0/963   | 0.29        | 0/1295  |
| 64  | AN    | 0.17         | 0/886   | 0.25        | 0/1199  |
| 65  | AO    | 0.13         | 0/1648  | 0.26        | 0/2243  |
| 66  | AP    | 0.19         | 0/798   | 0.26        | 0/1070  |
| 67  | AR    | 0.12         | 0/2456  | 0.24        | 0/3317  |
| 68  | AS    | 0.15         | 0/1138  | 0.23        | 0/1533  |
| 69  | AT    | 0.15         | 0/1402  | 0.27        | 0/1883  |
| 70  | AU    | 0.14         | 0/1510  | 0.26        | 0/2025  |
| 71  | AV    | 0.13         | 0/3030  | 0.30        | 0/4093  |
| 72  | AW    | 0.16         | 0/801   | 0.25        | 0/1079  |
| 73  | AZ    | 0.14         | 0/857   | 0.26        | 0/1141  |

| Mol | Chain | Bond lengths |          | Bond angles |          |
|-----|-------|--------------|----------|-------------|----------|
|     |       | RMSZ         | # Z  >5  | RMSZ        | # Z  >5  |
| 74  | A0    | 0.11         | 0/1834   | 0.26        | 0/2484   |
| 75  | A1    | 0.14         | 0/2313   | 0.28        | 0/3129   |
| 76  | A3    | 0.22         | 0/636    | 0.28        | 0/839    |
| 77  | Az    | 0.15         | 0/804    | 0.29        | 0/1248   |
| 78  | AY    | 0.14         | 0/1040   | 0.24        | 0/1402   |
| 79  | AA    | 0.21         | 0/22537  | 0.24        | 0/35085  |
| 80  | AI    | 0.19         | 0/1039   | 0.26        | 0/1400   |
| 81  | OX    | 0.19         | 0/478    | 0.39        | 0/639    |
| 82  | a     | 0.23         | 0/891    | 0.30        | 0/1208   |
| 83  | Ax    | 0.18         | 0/1673   | 0.30        | 0/2602   |
| 84  | A4    | 0.13         | 0/4877   | 0.29        | 0/6598   |
| 85  | B     | 0.14         | 0/1627   | 0.24        | 0/2527   |
| 86  | AX    | 0.14         | 0/2921   | 0.29        | 0/3954   |
| 87  | A2    | 0.17         | 0/947    | 0.25        | 0/1266   |
| 88  | AQ    | 0.21         | 0/754    | 0.23        | 0/1003   |
| 89  | k     | 0.15         | 0/783    | 0.24        | 0/1057   |
| All | All   | 0.23         | 0/187256 | 0.27        | 0/265790 |

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | 0     | 898   | 917      | 916      | 3       | 0            |
| 2   | 1     | 464   | 513      | 511      | 4       | 0            |
| 3   | 2     | 377   | 407      | 406      | 0       | 0            |
| 4   | 3     | 832   | 884      | 883      | 2       | 0            |
| 5   | 4     | 342   | 362      | 361      | 5       | 0            |
| 6   | 5     | 3210  | 3209     | 3206     | 10      | 0            |
| 7   | 6     | 2948  | 2844     | 2841     | 6       | 0            |
| 8   | 7     | 2390  | 2399     | 2397     | 9       | 0            |
| 9   | 8     | 1327  | 1369     | 1368     | 12      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 10  | 9     | 997   | 988      | 987      | 0       | 0            |
| 11  | A     | 33070 | 16801    | 16793    | 40      | 0            |
| 12  | C     | 1732  | 0        | 1740     | 186     | 0            |
| 13  | D     | 1859  | 1921     | 1920     | 1       | 0            |
| 14  | E     | 2406  | 2416     | 2415     | 7       | 0            |
| 15  | F     | 2031  | 2066     | 2065     | 2       | 0            |
| 16  | H     | 1661  | 1736     | 1734     | 9       | 0            |
| 17  | J     | 1330  | 1408     | 1407     | 9       | 0            |
| 18  | K     | 1455  | 1452     | 1452     | 6       | 0            |
| 19  | L     | 890   | 942      | 941      | 0       | 0            |
| 20  | M     | 2327  | 2396     | 2395     | 3       | 0            |
| 21  | N     | 1786  | 1818     | 1817     | 3       | 0            |
| 22  | O     | 1259  | 1295     | 1294     | 4       | 0            |
| 23  | P     | 1173  | 1166     | 1165     | 2       | 0            |
| 24  | Q     | 1990  | 2031     | 2031     | 4       | 0            |
| 25  | R     | 1154  | 1215     | 1214     | 1       | 0            |
| 26  | S     | 1293  | 1366     | 1365     | 1       | 0            |
| 27  | T     | 1369  | 1412     | 1410     | 6       | 0            |
| 28  | U     | 1248  | 1228     | 1228     | 4       | 0            |
| 29  | W     | 904   | 936      | 935      | 3       | 0            |
| 30  | X     | 2044  | 2061     | 2060     | 2       | 0            |
| 31  | Y     | 1556  | 1598     | 1597     | 2       | 0            |
| 32  | Z     | 996   | 1045     | 1044     | 1       | 0            |
| 33  | G     | 558   | 0        | 612      | 122     | 0            |
| 33  | t     | 354   | 378      | 377      | 4       | 0            |
| 33  | u     | 257   | 284      | 283      | 12      | 0            |
| 34  | I     | 1446  | 1533     | 1532     | 8       | 0            |
| 35  | V     | 1676  | 1689     | 1687     | 7       | 0            |
| 36  | b     | 1193  | 1186     | 1191     | 1       | 0            |
| 37  | d     | 2124  | 0        | 2125     | 99      | 0            |
| 38  | e     | 1931  | 1917     | 1916     | 14      | 0            |
| 39  | g     | 1113  | 1097     | 1097     | 0       | 0            |
| 40  | h     | 895   | 883      | 881      | 0       | 0            |
| 41  | i     | 828   | 859      | 857      | 0       | 0            |
| 42  | j     | 745   | 747      | 746      | 1       | 0            |
| 43  | l     | 688   | 675      | 674      | 4       | 0            |
| 44  | m     | 791   | 760      | 796      | 6       | 0            |
| 45  | n     | 215   | 0        | 52       | 0       | 0            |
| 46  | o     | 798   | 806      | 804      | 4       | 0            |
| 47  | q     | 1495  | 942      | 1492     | 57      | 0            |
| 48  | r     | 1322  | 1349     | 1348     | 1       | 0            |
| 49  | c     | 2299  | 2322     | 2320     | 4       | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 50  | f     | 1252  | 1271     | 1269     | 12      | 0            |
| 51  | p     | 1205  | 1225     | 1223     | 6       | 0            |
| 52  | s     | 3148  | 3137     | 3131     | 8       | 0            |
| 53  | AB    | 1828  | 1816     | 1815     | 2       | 0            |
| 54  | AC    | 1083  | 1089     | 1088     | 5       | 0            |
| 55  | AD    | 2731  | 2805     | 2804     | 14      | 0            |
| 56  | AE    | 972   | 1000     | 1000     | 2       | 0            |
| 57  | AF    | 1725  | 1771     | 1769     | 5       | 0            |
| 58  | AG    | 2688  | 2689     | 2687     | 10      | 0            |
| 59  | AH    | 1152  | 1187     | 1183     | 16      | 0            |
| 60  | AJ    | 839   | 888      | 887      | 5       | 0            |
| 61  | AK    | 862   | 886      | 885      | 6       | 0            |
| 62  | AL    | 1453  | 1541     | 1540     | 9       | 0            |
| 63  | AM    | 942   | 966      | 965      | 10      | 0            |
| 64  | AN    | 868   | 929      | 928      | 5       | 0            |
| 65  | AO    | 1592  | 1557     | 1557     | 7       | 0            |
| 66  | AP    | 781   | 806      | 806      | 1       | 0            |
| 67  | AR    | 2409  | 2430     | 2428     | 10      | 0            |
| 68  | AS    | 1111  | 1116     | 1115     | 8       | 0            |
| 69  | AT    | 1371  | 1393     | 1393     | 2       | 0            |
| 70  | AU    | 1488  | 1501     | 1499     | 6       | 0            |
| 71  | AV    | 2969  | 2964     | 2961     | 41      | 0            |
| 72  | AW    | 789   | 804      | 802      | 4       | 0            |
| 73  | AZ    | 839   | 859      | 858      | 1       | 0            |
| 74  | A0    | 1787  | 1797     | 1796     | 7       | 0            |
| 75  | A1    | 2265  | 2296     | 2294     | 12      | 0            |
| 76  | A3    | 625   | 701      | 699      | 6       | 0            |
| 77  | Az    | 719   | 360      | 360      | 3       | 0            |
| 78  | AY    | 1010  | 963      | 957      | 8       | 0            |
| 79  | AA    | 20260 | 0        | 10285    | 833     | 0            |
| 80  | AI    | 1019  | 1058     | 1059     | 4       | 0            |
| 81  | OX    | 468   | 465      | 464      | 2       | 0            |
| 82  | a     | 865   | 830      | 829      | 5       | 0            |
| 83  | Ax    | 1498  | 766      | 766      | 3       | 0            |
| 84  | A4    | 4768  | 4767     | 4766     | 53      | 0            |
| 85  | B     | 1524  | 780      | 779      | 1       | 0            |
| 86  | AX    | 2849  | 2844     | 2844     | 25      | 0            |
| 87  | A2    | 935   | 971      | 971      | 6       | 0            |
| 88  | AQ    | 744   | 758      | 758      | 0       | 0            |
| 89  | k     | 774   | 785      | 784      | 3       | 0            |
| 90  | 0     | 1     | 0        | 0        | 0       | 0            |
| 90  | 4     | 1     | 0        | 0        | 0       | 0            |

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| Mol | Chain | Non-H  | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|--------|----------|----------|---------|--------------|
| 90  | AO    | 1      | 0        | 0        | 0       | 0            |
| 91  | 6     | 1      | 0        | 0        | 0       | 0            |
| 91  | A     | 29     | 0        | 0        | 0       | 0            |
| 91  | AA    | 18     | 0        | 0        | 0       | 0            |
| 91  | D     | 1      | 0        | 0        | 0       | 0            |
| 91  | M     | 2      | 0        | 0        | 0       | 0            |
| 91  | N     | 1      | 0        | 0        | 0       | 0            |
| 91  | W     | 1      | 0        | 0        | 0       | 0            |
| 91  | o     | 1      | 0        | 0        | 0       | 0            |
| 92  | A     | 50     | 44       | 95       | 5       | 0            |
| 92  | AA    | 20     | 0        | 36       | 5       | 0            |
| 92  | AG    | 10     | 0        | 17       | 6       | 0            |
| 93  | A     | 6      | 14       | 12       | 0       | 0            |
| 94  | A     | 136    | 0        | 0        | 0       | 0            |
| 94  | A3    | 1      | 0        | 0        | 0       | 0            |
| 94  | AA    | 61     | 0        | 0        | 0       | 0            |
| 94  | AB    | 1      | 0        | 0        | 0       | 0            |
| 94  | AX    | 1      | 0        | 0        | 0       | 0            |
| 94  | D     | 2      | 0        | 0        | 0       | 0            |
| 94  | E     | 1      | 0        | 0        | 0       | 0            |
| 94  | I     | 1      | 0        | 0        | 0       | 0            |
| 94  | g     | 1      | 0        | 0        | 0       | 0            |
| 95  | e     | 7      | 8        | 8        | 0       | 0            |
| 96  | AP    | 4      | 0        | 0        | 0       | 0            |
| 96  | AT    | 4      | 0        | 0        | 0       | 0            |
| 96  | r     | 4      | 0        | 0        | 0       | 0            |
| 97  | AA    | 44     | 0        | 26       | 1       | 0            |
| 98  | AA    | 42     | 0        | 75       | 18      | 0            |
| 99  | AX    | 31     | 11       | 12       | 0       | 0            |
| 100 | AX    | 28     | 12       | 12       | 1       | 0            |
| All | All   | 178765 | 136488   | 151985   | 1718    | 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 5.

All (1718) 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) |
|-------------------|-------------------|--------------------------|-------------------|
| 12:C:211:ILE:HD12 | 33:G:143:VAL:HG12 | 1.23                     | 1.11              |
| 47:q:164:LEU:HB3  | 47:q:168:VAL:HG21 | 1.38                     | 1.04              |
| 12:C:90:LEU:HG    | 12:C:153:LEU:HD22 | 1.45                     | 0.98              |

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| Atom-1             | Atom-2              | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|---------------------|--------------------------|-------------------|
| 33:G:185:LYS:HD2   | 33:G:188:LEU:HD11   | 1.46                     | 0.96              |
| 12:C:268:LEU:HD23  | 12:C:272:ASP:HB3    | 1.50                     | 0.93              |
| 79:AA:941:G:H4'    | 79:AA:942:A:H5''    | 1.49                     | 0.92              |
| 12:C:246:LEU:HD21  | 12:C:251:LEU:HD22   | 1.52                     | 0.91              |
| 33:G:132:VAL:HG12  | 33:G:197:LEU:HB3    | 1.52                     | 0.91              |
| 37:d:84:ILE:HA     | 37:d:211:GLN:HE22   | 1.35                     | 0.91              |
| 33:G:131:THR:HA    | 33:G:174:ALA:HA     | 1.50                     | 0.90              |
| 33:G:168:LEU:HA    | 33:G:170:GLN:HE22   | 1.37                     | 0.89              |
| 92:AG:401:SPD:H32  | 92:AA:1785:SPD:H71  | 1.54                     | 0.88              |
| 12:C:171:ASN:HB2   | 12:C:279:LEU:HD13   | 1.56                     | 0.87              |
| 47:q:168:VAL:HG12  | 47:q:175:PHE:HB2    | 1.56                     | 0.87              |
| 12:C:213:ALA:HA    | 12:C:245:LYS:HE3    | 1.55                     | 0.86              |
| 12:C:265:LYS:HB3   | 12:C:297:GLU:HB2    | 1.58                     | 0.85              |
| 47:q:164:LEU:HG    | 47:q:178:LEU:HD23   | 1.58                     | 0.85              |
| 79:AA:838:U:H2'    | 79:AA:839:A:H8      | 1.42                     | 0.85              |
| 79:AA:1414:C:H3'   | 79:AA:1415:G:H21    | 1.42                     | 0.85              |
| 98:AA:1782:SPM:H72 | 98:AA:1784:SPM:H61  | 1.58                     | 0.84              |
| 12:C:119:LYS:HD3   | 12:C:122:ILE:HD11   | 1.58                     | 0.83              |
| 12:C:89:ARG:HD2    | 12:C:153:LEU:HG     | 1.61                     | 0.82              |
| 12:C:268:LEU:HB3   | 12:C:272:ASP:HB2    | 1.60                     | 0.82              |
| 12:C:77:ARG:HH12   | 12:C:115:LYS:HD2    | 1.44                     | 0.81              |
| 37:d:119:GLN:HA    | 37:d:122:ILE:HD12   | 1.59                     | 0.81              |
| 33:G:134:LEU:HA    | 33:G:195:VAL:HA     | 1.62                     | 0.81              |
| 33:G:134:LEU:HB2   | 33:G:195:VAL:HG22   | 1.62                     | 0.81              |
| 98:AA:1782:SPM:H82 | 98:AA:1784:SPM:H111 | 1.63                     | 0.81              |
| 37:d:52:THR:HG23   | 37:d:55:GLU:H       | 1.46                     | 0.79              |
| 33:G:165:VAL:HG22  | 33:G:168:LEU:HD11   | 1.64                     | 0.79              |
| 33:G:165:VAL:HA    | 33:G:168:LEU:HG     | 1.65                     | 0.78              |
| 12:C:192:GLU:HA    | 12:C:227:ARG:HH12   | 1.48                     | 0.78              |
| 84:A4:428:ASP:OD2  | 84:A4:431:LEU:HD23  | 1.84                     | 0.77              |
| 79:AA:1353:A:H5'   | 79:AA:1354:A:H5'    | 1.65                     | 0.77              |
| 12:C:223:ASP:HB3   | 12:C:229:VAL:HG11   | 1.65                     | 0.77              |
| 2:1:54:VAL:HG13    | 47:q:128:MET:HE2    | 1.68                     | 0.76              |
| 12:C:207:LEU:HD22  | 33:G:158:LEU:HD13   | 1.68                     | 0.76              |
| 37:d:204:ASN:O     | 37:d:205:GLN:HG2    | 1.86                     | 0.76              |
| 33:G:168:LEU:HA    | 33:G:170:GLN:NE2    | 2.00                     | 0.76              |
| 79:AA:838:U:H2'    | 79:AA:839:A:C8      | 2.22                     | 0.75              |
| 37:d:88:TYR:HB2    | 37:d:196:GLN:OE1    | 1.87                     | 0.75              |
| 79:AA:1118:A:H3'   | 79:AA:1119:U:H5''   | 1.69                     | 0.75              |
| 12:C:89:ARG:HG3    | 12:C:129:GLU:HG2    | 1.69                     | 0.74              |
| 30:X:20:ILE:HG22   | 81:OX:434:LEU:HD23  | 1.69                     | 0.74              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 12:C:209:MET:HG2   | 12:C:251:LEU:HD13  | 1.69                     | 0.74              |
| 79:AA:1102:A:H4'   | 79:AA:1576:G:H5'   | 1.68                     | 0.74              |
| 79:AA:1440:G:H2'   | 79:AA:1441:A:H8    | 1.52                     | 0.74              |
| 37:d:207:ASN:HA    | 37:d:253:THR:HG21  | 1.68                     | 0.74              |
| 12:C:91:ALA:HB2    | 12:C:108:ILE:HD12  | 1.68                     | 0.74              |
| 79:AA:973:C:O2'    | 79:AA:974:U:H5'    | 1.87                     | 0.74              |
| 38:e:183:THR:HG23  | 38:e:186:GLY:H     | 1.52                     | 0.73              |
| 79:AA:1317:A:H3'   | 79:AA:1318:A:H8    | 1.53                     | 0.73              |
| 84:A4:170:VAL:HG23 | 84:A4:247:ILE:HD11 | 1.70                     | 0.73              |
| 79:AA:1207:U:H5''  | 79:AA:1218:A:H61   | 1.53                     | 0.73              |
| 12:C:124:THR:HA    | 12:C:127:LYS:HG2   | 1.71                     | 0.73              |
| 79:AA:922:C:H2'    | 79:AA:923:A:C8     | 2.23                     | 0.73              |
| 79:AA:1401:G:N2    | 79:AA:1403:A:H3'   | 2.03                     | 0.73              |
| 12:C:152:ALA:HB2   | 12:C:289:VAL:HA    | 1.70                     | 0.73              |
| 79:AA:1427:A:H2'   | 79:AA:1428:G:C8    | 2.24                     | 0.73              |
| 79:AA:673:U:H2'    | 79:AA:674:U:C6     | 2.23                     | 0.72              |
| 12:C:77:ARG:HG3    | 60:AJ:104:GLU:OE2  | 1.89                     | 0.72              |
| 12:C:180:ARG:NH1   | 12:C:181:HIS:HB3   | 2.03                     | 0.72              |
| 79:AA:1131:C:H2'   | 79:AA:1132:U:C6    | 2.25                     | 0.72              |
| 79:AA:1353:A:H5'   | 79:AA:1354:A:C5'   | 2.19                     | 0.72              |
| 71:AV:163:VAL:O    | 71:AV:167:VAL:HG23 | 1.89                     | 0.72              |
| 79:AA:1095:U:C2'   | 79:AA:1096:A:H5'   | 2.19                     | 0.72              |
| 12:C:86:LEU:HB3    | 12:C:290:ILE:HD11  | 1.71                     | 0.72              |
| 79:AA:705:C:H3'    | 79:AA:706:C:C6     | 2.25                     | 0.72              |
| 79:AA:1578:A:H2'   | 79:AA:1579:C:C6    | 2.24                     | 0.72              |
| 12:C:192:GLU:HA    | 12:C:227:ARG:NH1   | 2.05                     | 0.72              |
| 79:AA:1007:G:H2'   | 79:AA:1008:A:H8    | 1.55                     | 0.72              |
| 71:AV:353:LEU:O    | 71:AV:357:THR:HG23 | 1.90                     | 0.71              |
| 79:AA:1440:G:H2'   | 79:AA:1441:A:C8    | 2.24                     | 0.71              |
| 37:d:110:GLU:O     | 37:d:113:LYS:HG2   | 1.90                     | 0.71              |
| 60:AJ:72:LYS:HG3   | 79:AA:1557:A:H5''  | 1.70                     | 0.71              |
| 12:C:267:GLN:HE21  | 12:C:297:GLU:HG2   | 1.56                     | 0.71              |
| 47:q:147:GLN:O     | 47:q:150:LYS:HG3   | 1.91                     | 0.71              |
| 79:AA:1562:G:H1'   | 79:AA:1583:MA6:H2  | 1.72                     | 0.71              |
| 51:p:133:LEU:HD21  | 51:p:157:MET:HE1   | 1.73                     | 0.71              |
| 79:AA:1349:U:H2'   | 79:AA:1350:G:H8    | 1.54                     | 0.71              |
| 79:AA:1025:A:H2'   | 79:AA:1026:A:C8    | 2.25                     | 0.71              |
| 79:AA:839:A:H2'    | 79:AA:840:A:H8     | 1.54                     | 0.71              |
| 79:AA:1089:U:H2'   | 79:AA:1090:A:H8    | 1.56                     | 0.71              |
| 79:AA:1135:C:O2'   | 79:AA:1136:C:H5'   | 1.90                     | 0.71              |
| 79:AA:958:C:H4'    | 79:AA:959:C:O4'    | 1.91                     | 0.70              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 16:H:174:VAL:HG12 | 16:H:192:HIS:HB3   | 1.72                     | 0.70              |
| 33:G:168:LEU:HD23 | 33:G:170:GLN:NE2   | 2.06                     | 0.70              |
| 79:AA:663:A:H2'   | 79:AA:664:G:C8     | 2.25                     | 0.70              |
| 79:AA:1132:U:H2'  | 79:AA:1133:C:C6    | 2.26                     | 0.70              |
| 12:C:282:ALA:HA   | 12:C:285:ASN:HD21  | 1.57                     | 0.70              |
| 79:AA:848:U:O2'   | 79:AA:849:U:H5'    | 1.92                     | 0.70              |
| 37:d:96:ARG:HG2   | 37:d:97:ILE:H      | 1.57                     | 0.69              |
| 12:C:204:GLU:O    | 12:C:208:GLU:HG2   | 1.93                     | 0.69              |
| 79:AA:1033:U:H2'  | 79:AA:1034:U:C6    | 2.28                     | 0.69              |
| 79:AA:1414:C:H2'  | 79:AA:1415:G:H5'   | 1.73                     | 0.69              |
| 79:AA:842:C:H2'   | 79:AA:843:G:C8     | 2.27                     | 0.69              |
| 79:AA:921:U:H2'   | 79:AA:922:C:O4'    | 1.93                     | 0.69              |
| 12:C:205:ARG:HA   | 12:C:208:GLU:HG2   | 1.75                     | 0.69              |
| 79:AA:1126:A:O2'  | 79:AA:1127:A:H5'   | 1.92                     | 0.69              |
| 33:G:157:ASN:O    | 33:G:160:GLN:HG3   | 1.93                     | 0.69              |
| 79:AA:867:C:H2'   | 79:AA:870:C:H42    | 1.56                     | 0.69              |
| 55:AD:355:ARG:NH1 | 79:AA:1118:A:H4'   | 2.08                     | 0.69              |
| 33:G:152:TYR:OH   | 33:G:173:LYS:HG3   | 1.92                     | 0.68              |
| 33:G:185:LYS:HA   | 33:G:188:LEU:HD21  | 1.74                     | 0.68              |
| 12:C:167:ILE:HD11 | 12:C:283:LEU:HD23  | 1.75                     | 0.68              |
| 37:d:160:LEU:HD23 | 37:d:169:PHE:CE1   | 2.28                     | 0.68              |
| 79:AA:873:G:H1'   | 79:AA:921:U:H1'    | 1.76                     | 0.68              |
| 79:AA:1382:A:H5'' | 86:AX:166:ARG:HH21 | 1.58                     | 0.68              |
| 12:C:241:GLN:HA   | 12:C:244:LYS:HE3   | 1.75                     | 0.68              |
| 64:AN:95:VAL:HG23 | 64:AN:96:THR:HG23  | 1.75                     | 0.68              |
| 12:C:192:GLU:OE2  | 12:C:252:CYS:HB2   | 1.93                     | 0.68              |
| 47:q:191:LYS:HA   | 47:q:194:LYS:HG2   | 1.76                     | 0.68              |
| 79:AA:952:A:H2'   | 79:AA:953:U:C6     | 2.29                     | 0.68              |
| 79:AA:1589:C:H2'  | 79:AA:1590:A:C8    | 2.28                     | 0.68              |
| 12:C:201:VAL:HG22 | 12:C:205:ARG:HH22  | 1.57                     | 0.68              |
| 79:AA:1349:U:H2'  | 79:AA:1350:G:C8    | 2.28                     | 0.68              |
| 86:AX:74:ASP:O    | 86:AX:78:VAL:HG12  | 1.93                     | 0.68              |
| 79:AA:738:A:H3'   | 79:AA:739:C:H6     | 1.58                     | 0.68              |
| 79:AA:1283:A:H3'  | 79:AA:1284:U:H5''  | 1.76                     | 0.68              |
| 79:AA:1528:A:H2'  | 79:AA:1529:A:H8    | 1.59                     | 0.68              |
| 37:d:160:LEU:O    | 37:d:164:VAL:HG22  | 1.92                     | 0.68              |
| 68:AS:50:ARG:HH22 | 79:AA:1119:U:H5'   | 1.58                     | 0.68              |
| 79:AA:705:C:H3'   | 79:AA:706:C:H6     | 1.58                     | 0.68              |
| 47:q:152:ARG:O    | 47:q:156:LEU:HG    | 1.94                     | 0.67              |
| 79:AA:757:A:H4'   | 79:AA:758:U:H5''   | 1.76                     | 0.67              |
| 79:AA:916:C:H2'   | 79:AA:917:C:C6     | 2.29                     | 0.67              |

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| Atom-1             | Atom-2              | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|---------------------|--------------------------|-------------------|
| 79:AA:1578:A:H2'   | 79:AA:1579:C:H6     | 1.57                     | 0.67              |
| 11:A:2103:A:HO2'   | 32:Z:35:LYS:N       | 1.93                     | 0.67              |
| 12:C:217:ASP:HB2   | 12:C:233:ILE:HB     | 1.75                     | 0.67              |
| 98:AA:1782:SPM:H91 | 98:AA:1784:SPM:H122 | 1.76                     | 0.67              |
| 37:d:219:ARG:HD3   | 37:d:239:PRO:HB2    | 1.77                     | 0.67              |
| 59:AH:180:LEU:HD12 | 59:AH:184:ILE:HG21  | 1.76                     | 0.67              |
| 79:AA:1007:G:H2'   | 79:AA:1008:A:C8     | 2.30                     | 0.67              |
| 71:AV:64:LYS:HZ2   | 79:AA:1530:A:H5''   | 1.59                     | 0.67              |
| 79:AA:765:C:H5'    | 79:AA:766:G:OP2     | 1.95                     | 0.67              |
| 12:C:89:ARG:HB2    | 12:C:129:GLU:OE2    | 1.94                     | 0.67              |
| 47:q:176:GLN:HA    | 47:q:179:LEU:CD2    | 2.24                     | 0.67              |
| 35:V:102:MET:HE3   | 37:d:48:PRO:HG2     | 1.75                     | 0.67              |
| 38:e:101:LYS:O     | 38:e:105:LEU:HD23   | 1.95                     | 0.67              |
| 79:AA:1487:C:H2'   | 79:AA:1488:5MC:HM53 | 1.76                     | 0.67              |
| 37:d:110:GLU:O     | 37:d:114:LYS:HG2    | 1.95                     | 0.66              |
| 79:AA:919:A:H4'    | 79:AA:920:G:O5'     | 1.94                     | 0.66              |
| 79:AA:1542:U:H2'   | 79:AA:1543:U:C6     | 2.30                     | 0.66              |
| 18:K:15:ALA:CB     | 49:c:269:LEU:HD22   | 2.25                     | 0.66              |
| 33:G:180:GLU:O     | 33:G:184:ILE:HG23   | 1.95                     | 0.66              |
| 79:AA:1404:A:H4'   | 79:AA:1406:U:H5     | 1.59                     | 0.66              |
| 12:C:81:PHE:HA     | 12:C:84:LEU:CD2     | 2.26                     | 0.66              |
| 79:AA:947:U:O2'    | 79:AA:948:U:H5'     | 1.96                     | 0.66              |
| 79:AA:1492:A:O2'   | 79:AA:1493:C:H5'    | 1.96                     | 0.66              |
| 47:q:155:ARG:HG2   | 47:q:159:GLU:OE2    | 1.94                     | 0.66              |
| 33:G:149:ILE:HG22  | 33:G:156:ILE:CD1    | 2.25                     | 0.66              |
| 79:AA:1372:C:H2'   | 79:AA:1373:U:C6     | 2.31                     | 0.66              |
| 79:AA:1461:A:H4'   | 79:AA:1462:G:C8     | 2.31                     | 0.66              |
| 12:C:227:ARG:NH1   | 12:C:229:VAL:HG12   | 2.11                     | 0.66              |
| 33:G:132:VAL:HG23  | 33:G:172:ILE:HB     | 1.76                     | 0.66              |
| 79:AA:1421:G:H5''  | 79:AA:1422:G:OP1    | 1.96                     | 0.66              |
| 79:AA:676:G:H2'    | 79:AA:677:C:H6      | 1.61                     | 0.66              |
| 79:AA:1549:G:O2'   | 79:AA:1550:A:H5'    | 1.95                     | 0.66              |
| 12:C:243:ARG:HD2   | 12:C:256:CYS:HB3    | 1.75                     | 0.66              |
| 79:AA:1170:G:O2'   | 79:AA:1171:A:H5'    | 1.96                     | 0.66              |
| 79:AA:1276:A:H2'   | 79:AA:1277:A:H5'    | 1.77                     | 0.66              |
| 79:AA:1400:U:H2'   | 79:AA:1401:G:O4'    | 1.96                     | 0.66              |
| 33:G:134:LEU:HD23  | 33:G:168:LEU:HD22   | 1.78                     | 0.65              |
| 71:AV:68:SER:N     | 79:AA:1523:A:H5''   | 2.11                     | 0.65              |
| 79:AA:920:G:H2'    | 79:AA:921:U:C6      | 2.30                     | 0.65              |
| 79:AA:1032:C:O2'   | 79:AA:1033:U:H5'    | 1.96                     | 0.65              |
| 79:AA:840:A:O2'    | 79:AA:841:A:H5'     | 1.95                     | 0.65              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1002:C:H2'   | 79:AA:1003:A:H8    | 1.61                     | 0.65              |
| 98:AA:1782:SPM:H72 | 98:AA:1784:SPM:H91 | 1.78                     | 0.65              |
| 86:AX:242:ILE:HD11 | 100:AX:503:GDP:C5  | 2.31                     | 0.65              |
| 28:U:150:TRP:CZ2   | 37:d:264:LYS:HE3   | 2.31                     | 0.65              |
| 79:AA:771:A:H2'    | 79:AA:772:A:C8     | 2.31                     | 0.65              |
| 33:G:145:LEU:O     | 33:G:149:ILE:HG13  | 1.96                     | 0.65              |
| 47:q:164:LEU:CG    | 47:q:178:LEU:HD23  | 2.26                     | 0.65              |
| 79:AA:922:C:H2'    | 79:AA:923:A:H8     | 1.62                     | 0.65              |
| 47:q:145:LYS:NZ    | 47:q:149:ASP:HB2   | 2.11                     | 0.65              |
| 79:AA:1237:A:H1'   | 79:AA:1254:C:O2    | 1.96                     | 0.65              |
| 5:4:66:PHE:N       | 11:A:3013:G:HO2'   | 1.94                     | 0.65              |
| 79:AA:914:A:H2'    | 79:AA:915:C:C6     | 2.30                     | 0.65              |
| 12:C:90:LEU:CG     | 12:C:153:LEU:HD22  | 2.21                     | 0.65              |
| 33:G:179:ALA:O     | 33:G:182:GLU:HG3   | 1.97                     | 0.65              |
| 37:d:201:SER:O     | 37:d:208:VAL:HG12  | 1.97                     | 0.65              |
| 37:d:158:ASP:O     | 37:d:162:THR:HG23  | 1.96                     | 0.65              |
| 47:q:141:GLU:O     | 47:q:144:GLU:HG3   | 1.97                     | 0.65              |
| 79:AA:738:A:H3'    | 79:AA:739:C:C6     | 2.32                     | 0.65              |
| 79:AA:1414:C:H3'   | 79:AA:1415:G:N2    | 2.12                     | 0.65              |
| 9:8:136:ILE:HD11   | 50:f:169:ILE:CG2   | 2.26                     | 0.65              |
| 79:AA:1165:C:H2'   | 79:AA:1166:A:C8    | 2.32                     | 0.65              |
| 79:AA:1340:C:O2'   | 79:AA:1341:C:H5'   | 1.96                     | 0.65              |
| 5:4:103:MET:HE1    | 11:A:2952:U:H5'    | 1.78                     | 0.64              |
| 92:AG:401:SPD:H41  | 92:AA:1785:SPD:H52 | 1.79                     | 0.64              |
| 79:AA:1507:A:H2'   | 79:AA:1508:C:H6    | 1.61                     | 0.64              |
| 37:d:140:LYS:HA    | 37:d:143:ASP:OD2   | 1.97                     | 0.64              |
| 33:G:132:VAL:HA    | 33:G:197:LEU:HA    | 1.80                     | 0.64              |
| 37:d:208:VAL:H     | 37:d:253:THR:HG23  | 1.63                     | 0.64              |
| 79:AA:1157:U:H2'   | 79:AA:1158:U:O2    | 1.97                     | 0.64              |
| 12:C:282:ALA:HA    | 12:C:285:ASN:ND2   | 2.12                     | 0.64              |
| 70:AU:71:ARG:O     | 70:AU:75:VAL:HG23  | 1.97                     | 0.64              |
| 79:AA:852:A:H3'    | 79:AA:853:C:H6     | 1.62                     | 0.64              |
| 65:AO:208:PRO:HG2  | 65:AO:213:LEU:HD21 | 1.80                     | 0.64              |
| 79:AA:956:C:H2'    | 79:AA:957:C:O4'    | 1.97                     | 0.64              |
| 79:AA:1589:C:H2'   | 79:AA:1590:A:H8    | 1.61                     | 0.64              |
| 79:AA:1365:A:H2'   | 79:AA:1366:C:C6    | 2.32                     | 0.64              |
| 6:5:336:LEU:HD21   | 6:5:362:THR:HG23   | 1.79                     | 0.64              |
| 79:AA:747:A:H2'    | 79:AA:748:G:C8     | 2.33                     | 0.64              |
| 79:AA:1495:C:H2'   | 79:AA:1496:U:C6    | 2.33                     | 0.64              |
| 79:AA:1117:A:C2'   | 79:AA:1118:A:H5'   | 2.27                     | 0.64              |
| 37:d:93:GLY:CA     | 37:d:96:ARG:HB3    | 2.28                     | 0.64              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:700:A:H4'    | 79:AA:701:G:O5'    | 1.96                     | 0.64              |
| 12:C:167:ILE:CD1   | 12:C:283:LEU:HD23  | 2.28                     | 0.63              |
| 47:q:176:GLN:O     | 47:q:179:LEU:HG    | 1.99                     | 0.63              |
| 79:AA:676:G:H2'    | 79:AA:677:C:C6     | 2.33                     | 0.63              |
| 79:AA:1044:U:H2'   | 79:AA:1045:G:O4'   | 1.99                     | 0.63              |
| 79:AA:1204:C:H2'   | 79:AA:1205:U:O4'   | 1.98                     | 0.63              |
| 33:G:165:VAL:HA    | 33:G:168:LEU:CG    | 2.28                     | 0.63              |
| 79:AA:743:C:H2'    | 79:AA:744:A:O4'    | 1.97                     | 0.63              |
| 33:G:156:ILE:HB    | 33:G:160:GLN:NE2   | 2.13                     | 0.63              |
| 79:AA:927:G:O2'    | 79:AA:928:A:H5'    | 1.98                     | 0.63              |
| 79:AA:1076:5MU:O2  | 79:AA:1076:5MU:H2' | 1.97                     | 0.63              |
| 67:AR:115:THR:O    | 67:AR:119:VAL:HG23 | 1.99                     | 0.63              |
| 71:AV:130:VAL:HG22 | 71:AV:166:GLU:OE2  | 1.99                     | 0.63              |
| 79:AA:1042:U:H2'   | 79:AA:1043:C:C6    | 2.33                     | 0.63              |
| 79:AA:1523:A:H2'   | 79:AA:1524:A:C8    | 2.33                     | 0.63              |
| 12:C:119:LYS:HG3   | 12:C:123:GLU:HG2   | 1.80                     | 0.63              |
| 79:AA:753:A:O2'    | 79:AA:754:A:H5'    | 1.99                     | 0.63              |
| 6:5:165:GLN:NE2    | 6:5:179:VAL:HG21   | 2.14                     | 0.63              |
| 79:AA:847:G:H2'    | 79:AA:848:U:C6     | 2.33                     | 0.63              |
| 79:AA:990:U:H2'    | 79:AA:991:G:O4'    | 1.99                     | 0.63              |
| 12:C:81:PHE:HA     | 12:C:84:LEU:HD21   | 1.81                     | 0.63              |
| 79:AA:726:C:H2'    | 79:AA:727:U:H6     | 1.64                     | 0.63              |
| 79:AA:1175:G:H2'   | 79:AA:1176:G:H8    | 1.64                     | 0.63              |
| 79:AA:1436:C:O2'   | 79:AA:1437:U:H5'   | 1.97                     | 0.62              |
| 12:C:207:LEU:HD22  | 33:G:158:LEU:CD1   | 2.28                     | 0.62              |
| 37:d:146:ILE:O     | 37:d:150:LEU:HD23  | 1.99                     | 0.62              |
| 47:q:168:VAL:CG1   | 47:q:175:PHE:HB2   | 2.28                     | 0.62              |
| 79:AA:853:C:O2'    | 79:AA:854:U:H5'    | 1.99                     | 0.62              |
| 79:AA:866:A:O2'    | 79:AA:867:C:H5'    | 2.00                     | 0.62              |
| 86:AX:108:LEU:HD23 | 86:AX:141:VAL:HG11 | 1.80                     | 0.62              |
| 37:d:105:LEU:O     | 37:d:109:THR:HG23  | 1.98                     | 0.62              |
| 62:AL:126:GLU:OE2  | 62:AL:177:VAL:HG11 | 2.00                     | 0.62              |
| 79:AA:739:C:H2'    | 79:AA:740:G:O4'    | 1.98                     | 0.62              |
| 12:C:209:MET:HG2   | 12:C:251:LEU:CD1   | 2.30                     | 0.62              |
| 33:G:185:LYS:HA    | 33:G:188:LEU:CD2   | 2.29                     | 0.62              |
| 47:q:148:ALA:O     | 47:q:151:GLU:HG3   | 1.99                     | 0.62              |
| 79:AA:1185:C:O2'   | 79:AA:1186:A:H5'   | 1.99                     | 0.62              |
| 79:AA:1356:A:H2'   | 79:AA:1357:A:H5'   | 1.82                     | 0.62              |
| 12:C:110:GLU:HA    | 12:C:113:ARG:HH11  | 1.64                     | 0.62              |
| 33:G:134:LEU:CD2   | 33:G:168:LEU:HD22  | 2.30                     | 0.62              |
| 37:d:287:LEU:HD11  | 37:d:293:TYR:HA    | 1.81                     | 0.62              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1397:U:O2'   | 79:AA:1398:U:H5'   | 1.99                     | 0.62              |
| 12:C:81:PHE:O      | 12:C:84:LEU:HG     | 2.00                     | 0.62              |
| 33:G:129:HIS:HA    | 33:G:176:VAL:O     | 2.00                     | 0.62              |
| 79:AA:673:U:H2'    | 79:AA:674:U:H6     | 1.65                     | 0.62              |
| 79:AA:1372:C:H2'   | 79:AA:1373:U:H6    | 1.65                     | 0.62              |
| 33:G:159:VAL:HB    | 33:G:163:LYS:NZ    | 2.15                     | 0.62              |
| 79:AA:680:U:H2'    | 79:AA:681:U:H6     | 1.65                     | 0.62              |
| 79:AA:949:U:O2     | 97:AA:1701:NAD:H6N | 1.99                     | 0.62              |
| 86:AX:244:LEU:HD22 | 86:AX:296:MET:HG3  | 1.80                     | 0.62              |
| 12:C:207:LEU:HD13  | 33:G:158:LEU:HD13  | 1.81                     | 0.62              |
| 15:F:218:LEU:HD13  | 15:F:230:ILE:HD11  | 1.82                     | 0.62              |
| 33:G:150:LYS:HE2   | 33:G:156:ILE:O     | 2.00                     | 0.62              |
| 71:AV:66:PRO:HD3   | 79:AA:1529:A:H1'   | 1.82                     | 0.62              |
| 79:AA:970:A:H2'    | 79:AA:971:A:C8     | 2.35                     | 0.62              |
| 79:AA:1411:G:O2'   | 79:AA:1412:G:H5'   | 2.00                     | 0.62              |
| 79:AA:1439:A:H2'   | 79:AA:1440:G:H8    | 1.64                     | 0.62              |
| 79:AA:736:C:H2'    | 79:AA:737:C:H5     | 1.65                     | 0.61              |
| 79:AA:982:A:H2'    | 79:AA:983:C:C6     | 2.35                     | 0.61              |
| 62:AL:209:LEU:HD13 | 76:A3:173:LEU:HD12 | 1.81                     | 0.61              |
| 79:AA:1177:C:H2'   | 79:AA:1178:G:H8    | 1.65                     | 0.61              |
| 79:AA:734:C:O5'    | 79:AA:735:A:H5''   | 2.00                     | 0.61              |
| 79:AA:1042:U:H2'   | 79:AA:1043:C:H6    | 1.64                     | 0.61              |
| 79:AA:1267:U:H2'   | 79:AA:1268:C:C6    | 2.35                     | 0.61              |
| 37:d:222:LEU:HD12  | 37:d:223:ALA:H     | 1.65                     | 0.61              |
| 47:q:149:ASP:O     | 47:q:153:ARG:HG2   | 2.01                     | 0.61              |
| 79:AA:689:U:H2'    | 79:AA:690:U:C6     | 2.36                     | 0.61              |
| 79:AA:970:A:H2'    | 79:AA:971:A:H8     | 1.64                     | 0.61              |
| 98:AA:1782:SPM:C7  | 98:AA:1784:SPM:H91 | 2.31                     | 0.61              |
| 84:A4:556:LYS:HE3  | 84:A4:579:ILE:HD13 | 1.82                     | 0.61              |
| 12:C:107:ASN:O     | 12:C:110:GLU:HG3   | 2.01                     | 0.61              |
| 33:G:129:HIS:HB2   | 33:G:175:ASN:HA    | 1.83                     | 0.61              |
| 79:AA:1183:U:O2'   | 79:AA:1184:U:H5'   | 2.01                     | 0.61              |
| 79:AA:1358:A:H2'   | 79:AA:1359:U:C6    | 2.35                     | 0.61              |
| 12:C:151:GLU:OE2   | 12:C:291:HIS:HB3   | 2.00                     | 0.61              |
| 55:AD:244:LEU:HD22 | 55:AD:343:LEU:HD23 | 1.80                     | 0.61              |
| 79:AA:867:C:H2'    | 79:AA:870:C:N4     | 2.16                     | 0.61              |
| 79:AA:1231:A:H1'   | 79:AA:1236:C:N4    | 2.14                     | 0.61              |
| 79:AA:1422:G:H2'   | 79:AA:1423:A:C8    | 2.36                     | 0.61              |
| 55:AD:355:ARG:HH12 | 79:AA:1118:A:H4'   | 1.66                     | 0.61              |
| 65:AO:150:LEU:O    | 65:AO:154:ILE:HD12 | 2.01                     | 0.61              |
| 71:AV:64:LYS:NZ    | 79:AA:1530:A:H5''  | 2.16                     | 0.61              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:669:U:O2'    | 79:AA:670:C:H5'    | 2.01                     | 0.61              |
| 79:AA:1067:A:O2'   | 79:AA:1068:A:H5'   | 2.01                     | 0.61              |
| 79:AA:1375:C:O2'   | 79:AA:1376:C:H5'   | 2.01                     | 0.61              |
| 79:AA:1533:C:O2'   | 79:AA:1534:C:H5'   | 2.01                     | 0.61              |
| 7:6:206:TYR:HH     | 7:6:214:TRP:CG     | 2.19                     | 0.61              |
| 47:q:156:LEU:HA    | 47:q:159:GLU:OE1   | 2.00                     | 0.61              |
| 79:AA:839:A:H2'    | 79:AA:840:A:C8     | 2.36                     | 0.61              |
| 79:AA:853:C:H2'    | 79:AA:854:U:C6     | 2.36                     | 0.61              |
| 79:AA:1232:A:O2'   | 79:AA:1233:C:H5'   | 2.01                     | 0.61              |
| 79:AA:1595:G:H2'   | 79:AA:1596:A:C8    | 2.36                     | 0.61              |
| 33:u:60:TYR:N      | 33:u:64:ILE:HD11   | 2.16                     | 0.60              |
| 79:AA:738:A:H5'    | 79:AA:739:C:OP2    | 2.00                     | 0.60              |
| 79:AA:916:C:H2'    | 79:AA:917:C:H6     | 1.66                     | 0.60              |
| 79:AA:1080:A:H1'   | 79:AA:1082:A:N7    | 2.16                     | 0.60              |
| 79:AA:1408:A:H5'   | 79:AA:1446:A:O2'   | 2.01                     | 0.60              |
| 12:C:119:LYS:HD3   | 12:C:122:ILE:CD1   | 2.29                     | 0.60              |
| 12:C:163:ASP:O     | 12:C:167:ILE:HG23  | 2.01                     | 0.60              |
| 79:AA:658:G:O2'    | 79:AA:659:U:H5'    | 2.02                     | 0.60              |
| 79:AA:711:U:H5'    | 79:AA:712:C:C5     | 2.36                     | 0.60              |
| 79:AA:1470:A:H2'   | 79:AA:1471:A:H8    | 1.66                     | 0.60              |
| 98:AA:1782:SPM:H31 | 98:AA:1784:SPM:H32 | 1.83                     | 0.60              |
| 12:C:243:ARG:NH2   | 12:C:255:SER:HA    | 2.17                     | 0.60              |
| 16:H:98:LEU:HD11   | 16:H:105:VAL:HG23  | 1.83                     | 0.60              |
| 21:N:71:ASP:OD1    | 21:N:72:ILE:HG23   | 2.01                     | 0.60              |
| 33:G:164:LEU:CD1   | 33:G:168:LEU:HD21  | 2.31                     | 0.60              |
| 33:G:165:VAL:HA    | 33:G:168:LEU:CD1   | 2.32                     | 0.60              |
| 34:I:188:ARG:O     | 34:I:192:ILE:HD12  | 2.00                     | 0.60              |
| 37:d:288:LYS:HB2   | 37:d:291:GLU:OE2   | 2.01                     | 0.60              |
| 79:AA:726:C:H2'    | 79:AA:727:U:C6     | 2.37                     | 0.60              |
| 79:AA:1095:U:H2'   | 79:AA:1096:A:H5'   | 1.82                     | 0.60              |
| 2:1:54:VAL:HG13    | 47:q:128:MET:CE    | 2.30                     | 0.60              |
| 12:C:89:ARG:HD3    | 12:C:133:ASP:HB3   | 1.82                     | 0.60              |
| 33:u:64:ILE:O      | 33:u:68:VAL:HG23   | 2.01                     | 0.60              |
| 79:AA:649:A:O3'    | 79:AA:650:U:H3'    | 2.01                     | 0.60              |
| 79:AA:1416:A:H2'   | 79:AA:1417:A:C8    | 2.37                     | 0.60              |
| 79:AA:1427:A:H2'   | 79:AA:1428:G:H8    | 1.66                     | 0.60              |
| 8:7:84:ASN:O       | 8:7:85:ILE:HD13    | 2.02                     | 0.60              |
| 79:AA:914:A:H2'    | 79:AA:915:C:H6     | 1.67                     | 0.60              |
| 79:AA:1201:A:H2'   | 79:AA:1202:G:H8    | 1.65                     | 0.60              |
| 6:5:167:THR:HG21   | 52:s:281:HIS:CE1   | 2.37                     | 0.60              |
| 12:C:154:SER:HB3   | 12:C:288:ASP:OD1   | 2.02                     | 0.60              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 12:C:268:LEU:HD13  | 12:C:296:ILE:CD1   | 2.31                     | 0.60              |
| 33:G:161:ALA:O     | 33:G:164:LEU:HG    | 2.01                     | 0.60              |
| 79:AA:799:A:H2'    | 79:AA:800:C:C6     | 2.37                     | 0.60              |
| 79:AA:1244:C:O2'   | 79:AA:1245:U:H5'   | 2.01                     | 0.60              |
| 79:AA:1542:U:H2'   | 79:AA:1543:U:H6    | 1.66                     | 0.60              |
| 11:A:3089:A:H3'    | 11:A:3090:G:C5'    | 2.31                     | 0.60              |
| 79:AA:975:A:O2'    | 79:AA:976:A:H5'    | 2.02                     | 0.60              |
| 12:C:245:LYS:O     | 12:C:249:LEU:HD23  | 2.01                     | 0.60              |
| 33:G:134:LEU:HD13  | 33:G:195:VAL:HG22  | 1.84                     | 0.60              |
| 79:AA:768:A:H2'    | 79:AA:769:G:O4'    | 2.00                     | 0.60              |
| 79:AA:1583:MA6:H93 | 79:AA:1584:MA6:H92 | 1.84                     | 0.60              |
| 84:A4:302:VAL:HG21 | 84:A4:341:CYS:HB3  | 1.82                     | 0.60              |
| 37:d:209:TYR:CE1   | 37:d:251:GLN:HG3   | 2.37                     | 0.60              |
| 74:A0:51:PRO:HG3   | 79:AA:705:C:H5'    | 1.83                     | 0.60              |
| 16:H:174:VAL:HG12  | 16:H:192:HIS:CB    | 2.31                     | 0.60              |
| 79:AA:891:C:O2'    | 79:AA:892:A:H5'    | 2.02                     | 0.60              |
| 79:AA:1002:C:H2'   | 79:AA:1003:A:C8    | 2.36                     | 0.60              |
| 12:C:201:VAL:HA    | 12:C:205:ARG:NH2   | 2.16                     | 0.59              |
| 18:K:60:MET:HE2    | 18:K:133:ILE:HD11  | 1.84                     | 0.59              |
| 47:q:152:ARG:HG3   | 47:q:155:ARG:HH22  | 1.65                     | 0.59              |
| 79:AA:1119:U:H2'   | 79:AA:1120:C:O4'   | 2.02                     | 0.59              |
| 34:I:97:ALA:CB     | 34:I:164:MET:HE1   | 2.31                     | 0.59              |
| 79:AA:650:U:H4'    | 79:AA:651:A:OP1    | 2.01                     | 0.59              |
| 79:AA:872:G:H2'    | 79:AA:873:G:H8     | 1.66                     | 0.59              |
| 92:A:3471:SPD:H82  | 22:O:13:ARG:O      | 2.03                     | 0.59              |
| 12:C:208:GLU:O     | 12:C:212:GLU:HG2   | 2.03                     | 0.59              |
| 37:d:207:ASN:HA    | 37:d:253:THR:CG2   | 2.32                     | 0.59              |
| 37:d:106:ILE:O     | 37:d:110:GLU:HG2   | 2.02                     | 0.59              |
| 71:AV:70:LEU:HD21  | 71:AV:390:ILE:HD13 | 1.82                     | 0.59              |
| 79:AA:686:A:H2'    | 79:AA:687:G:H8     | 1.68                     | 0.59              |
| 79:AA:702:C:H1'    | 79:AA:842:C:H1'    | 1.83                     | 0.59              |
| 79:AA:754:A:O2'    | 79:AA:755:G:H5'    | 2.02                     | 0.59              |
| 12:C:117:MET:HG2   | 12:C:122:ILE:HG21  | 1.84                     | 0.59              |
| 34:I:116:LEU:CD2   | 34:I:154:LEU:HD22  | 2.32                     | 0.59              |
| 79:AA:788:U:O2'    | 79:AA:789:U:H5'    | 2.02                     | 0.59              |
| 79:AA:1113:G:O2'   | 79:AA:1114:U:H5'   | 2.01                     | 0.59              |
| 79:AA:1495:C:H2'   | 79:AA:1496:U:H6    | 1.68                     | 0.59              |
| 92:AG:401:SPD:C3   | 92:AA:1785:SPD:H71 | 2.27                     | 0.59              |
| 79:AA:680:U:H2'    | 79:AA:681:U:C6     | 2.37                     | 0.59              |
| 79:AA:686:A:H2'    | 79:AA:687:G:C8     | 2.37                     | 0.59              |
| 79:AA:1175:G:O2'   | 79:AA:1176:G:H5'   | 2.03                     | 0.59              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 79:AA:1377:C:H5'  | 86:AX:320:ARG:HD3  | 1.84                     | 0.59              |
| 79:AA:1414:C:C2'  | 79:AA:1415:G:H5'   | 2.33                     | 0.59              |
| 79:AA:987:A:H4'   | 79:AA:988:G:O5'    | 2.01                     | 0.59              |
| 79:AA:1445:G:O2'  | 79:AA:1446:A:H5'   | 2.03                     | 0.59              |
| 37:d:147:GLU:HG3  | 37:d:163:LEU:HD11  | 1.84                     | 0.59              |
| 11:A:2174:G:H4'   | 17:J:151:LEU:HD23  | 1.84                     | 0.58              |
| 12:C:246:LEU:HD21 | 12:C:251:LEU:CD2   | 2.30                     | 0.58              |
| 58:AG:226:GLU:O   | 58:AG:230:THR:HG23 | 2.03                     | 0.58              |
| 79:AA:1158:U:OP2  | 98:AA:1784:SPM:H92 | 2.03                     | 0.58              |
| 33:G:188:LEU:HD22 | 33:G:195:VAL:HG21  | 1.84                     | 0.58              |
| 37:d:208:VAL:HG23 | 37:d:252:LEU:HD12  | 1.86                     | 0.58              |
| 79:AA:863:C:O2'   | 79:AA:864:U:H5'    | 2.02                     | 0.58              |
| 79:AA:1131:C:H2'  | 79:AA:1132:U:H6    | 1.65                     | 0.58              |
| 79:AA:1379:A:H2'  | 79:AA:1380:G:H8    | 1.67                     | 0.58              |
| 12:C:89:ARG:HD2   | 12:C:153:LEU:CG    | 2.32                     | 0.58              |
| 79:AA:1188:A:H2'  | 79:AA:1429:C:OP2   | 2.03                     | 0.58              |
| 79:AA:1365:A:H4'  | 79:AA:1389:G:H4'   | 1.86                     | 0.58              |
| 84:A4:434:GLN:O   | 84:A4:438:LEU:HD23 | 2.03                     | 0.58              |
| 75:A1:53:LEU:HD12 | 84:A4:518:GLU:HG2  | 1.86                     | 0.58              |
| 33:G:134:LEU:N    | 33:G:195:VAL:HG13  | 2.18                     | 0.58              |
| 79:AA:757:A:H4'   | 79:AA:758:U:C5'    | 2.32                     | 0.58              |
| 79:AA:1398:U:H2'  | 79:AA:1399:A:H8    | 1.67                     | 0.58              |
| 79:AA:662:U:O2'   | 79:AA:663:A:H5'    | 2.04                     | 0.58              |
| 79:AA:695:A:H2'   | 79:AA:696:U:H5'    | 1.86                     | 0.58              |
| 27:T:62:ARG:HE    | 37:d:230:ARG:HD2   | 1.67                     | 0.58              |
| 33:G:132:VAL:HG12 | 33:G:197:LEU:CB    | 2.31                     | 0.58              |
| 37:d:186:VAL:HG21 | 37:d:239:PRO:HB3   | 1.85                     | 0.58              |
| 79:AA:824:U:O2'   | 79:AA:825:U:H5'    | 2.04                     | 0.58              |
| 79:AA:918:A:H4'   | 79:AA:920:G:H4'    | 1.84                     | 0.58              |
| 79:AA:1039:A:O2'  | 79:AA:1040:U:H5'   | 2.02                     | 0.58              |
| 86:AX:236:ALA:O   | 86:AX:240:VAL:HG23 | 2.03                     | 0.58              |
| 37:d:93:GLY:HA2   | 37:d:96:ARG:HB3    | 1.85                     | 0.58              |
| 79:AA:727:U:H2'   | 79:AA:728:C:O4'    | 2.03                     | 0.58              |
| 79:AA:969:A:O2'   | 79:AA:970:A:H5'    | 2.04                     | 0.58              |
| 79:AA:1281:U:O2'  | 79:AA:1282:G:H5'   | 2.03                     | 0.58              |
| 79:AA:1363:C:O2'  | 79:AA:1364:U:H5'   | 2.03                     | 0.58              |
| 79:AA:1379:A:H2'  | 79:AA:1380:G:C8    | 2.39                     | 0.58              |
| 86:AX:198:PHE:O   | 86:AX:202:ILE:HG22 | 2.03                     | 0.58              |
| 47:q:156:LEU:HA   | 47:q:159:GLU:CD    | 2.29                     | 0.58              |
| 47:q:179:LEU:O    | 47:q:183:GLU:HG3   | 2.04                     | 0.58              |
| 79:AA:1328:G:H2'  | 79:AA:1329:U:C6    | 2.38                     | 0.58              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1354:A:H2'   | 79:AA:1355:G:C8    | 2.39                     | 0.58              |
| 79:AA:695:A:H2'    | 79:AA:696:U:O4'    | 2.04                     | 0.58              |
| 79:AA:1439:A:H2'   | 79:AA:1440:G:C8    | 2.38                     | 0.58              |
| 14:E:61:ILE:O      | 14:E:65:VAL:HG22   | 2.04                     | 0.57              |
| 79:AA:945:G:O2'    | 79:AA:946:U:H5'    | 2.03                     | 0.57              |
| 79:AA:924:A:O2'    | 79:AA:925:U:H5'    | 2.05                     | 0.57              |
| 79:AA:1029:U:H2'   | 79:AA:1030:G:H5'   | 1.86                     | 0.57              |
| 12:C:208:GLU:CD    | 33:G:158:LEU:HD21  | 2.29                     | 0.57              |
| 33:t:86:LEU:HG     | 33:u:71:ILE:HD11   | 1.86                     | 0.57              |
| 65:AO:82:LYS:HZ3   | 79:AA:668:U:H5''   | 1.70                     | 0.57              |
| 79:AA:798:C:H2'    | 79:AA:799:A:H8     | 1.69                     | 0.57              |
| 79:AA:853:C:H2'    | 79:AA:854:U:H6     | 1.68                     | 0.57              |
| 79:AA:1140:A:O2'   | 79:AA:1141:C:H5'   | 2.05                     | 0.57              |
| 79:AA:1174:U:H2'   | 79:AA:1175:G:H8    | 1.69                     | 0.57              |
| 79:AA:1270:U:C4    | 92:AA:1785:SPD:H32 | 2.39                     | 0.57              |
| 79:AA:1382:A:H5''  | 86:AX:166:ARG:NH2  | 2.19                     | 0.57              |
| 12:C:151:GLU:HG2   | 12:C:151:GLU:O     | 2.04                     | 0.57              |
| 71:AV:126:LEU:O    | 71:AV:130:VAL:HG23 | 2.03                     | 0.57              |
| 79:AA:897:C:O2'    | 79:AA:898:C:H5'    | 2.04                     | 0.57              |
| 79:AA:1362:G:H2'   | 79:AA:1363:C:H6    | 1.70                     | 0.57              |
| 52:s:145:VAL:HG21  | 52:s:187:LEU:CD1   | 2.33                     | 0.57              |
| 60:AJ:72:LYS:CG    | 79:AA:1557:A:H5''  | 2.32                     | 0.57              |
| 79:AA:812:A:H2'    | 79:AA:813:A:C8     | 2.39                     | 0.57              |
| 79:AA:911:U:H2'    | 79:AA:912:U:C6     | 2.39                     | 0.57              |
| 79:AA:1005:U:H4'   | 80:AI:87:HIS:CE1   | 2.39                     | 0.57              |
| 79:AA:1231:A:H1'   | 79:AA:1236:C:H41   | 1.69                     | 0.57              |
| 79:AA:1376:C:H4'   | 79:AA:1377:C:H5'   | 1.85                     | 0.57              |
| 79:AA:1488:5MC:H2' | 79:AA:1489:G:C8    | 2.39                     | 0.57              |
| 79:AA:995:A:H2'    | 79:AA:996:A:C8     | 2.39                     | 0.57              |
| 79:AA:1065:C:H2'   | 79:AA:1066:C:O4'   | 2.05                     | 0.57              |
| 71:AV:70:LEU:HD22  | 71:AV:389:LEU:HG   | 1.87                     | 0.57              |
| 79:AA:701:G:H2'    | 79:AA:702:C:C6     | 2.39                     | 0.57              |
| 79:AA:705:C:O2'    | 79:AA:706:C:H5'    | 2.04                     | 0.57              |
| 79:AA:858:C:O2'    | 79:AA:859:U:H5'    | 2.04                     | 0.57              |
| 79:AA:1181:G:O2'   | 79:AA:1182:C:H5'   | 2.04                     | 0.57              |
| 84:A4:513:TRP:CD1  | 84:A4:551:CYS:HG   | 2.21                     | 0.57              |
| 33:G:134:LEU:CB    | 33:G:195:VAL:HG22  | 2.33                     | 0.57              |
| 79:AA:872:G:H2'    | 79:AA:873:G:C8     | 2.40                     | 0.57              |
| 79:AA:1399:A:H2'   | 79:AA:1400:U:C6    | 2.39                     | 0.57              |
| 79:AA:839:A:O2'    | 79:AA:840:A:H5'    | 2.05                     | 0.57              |
| 79:AA:982:A:H2'    | 79:AA:983:C:H6     | 1.70                     | 0.57              |

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| Atom-1             | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|-------------------|--------------------------|-------------------|
| 79:AA:1350:G:O2'   | 79:AA:1351:G:H5'  | 2.03                     | 0.57              |
| 12:C:209:MET:HE3   | 12:C:212:GLU:HB2  | 1.86                     | 0.57              |
| 33:G:133:ARG:HG3   | 33:G:198:GLU:OE1  | 2.05                     | 0.57              |
| 33:G:194:THR:HG23  | 33:G:194:THR:O    | 2.05                     | 0.57              |
| 59:AH:76:LEU:HD23  | 59:AH:174:LYS:HA  | 1.86                     | 0.57              |
| 79:AA:881:A:H2'    | 79:AA:882:A:N9    | 2.20                     | 0.57              |
| 62:AL:165:LYS:HE3  | 79:AA:947:U:H5''  | 1.86                     | 0.56              |
| 79:AA:659:U:O2'    | 79:AA:1285:G:H1'  | 2.05                     | 0.56              |
| 79:AA:661:C:O2'    | 79:AA:662:U:H5'   | 2.05                     | 0.56              |
| 79:AA:1348:G:O2'   | 79:AA:1349:U:H5'  | 2.05                     | 0.56              |
| 79:AA:1544:A:H2'   | 79:AA:1545:U:C6   | 2.39                     | 0.56              |
| 33:G:160:GLN:HA    | 33:G:163:LYS:HE2  | 1.87                     | 0.56              |
| 37:d:242:VAL:HG22  | 37:d:244:GLU:OE1  | 2.06                     | 0.56              |
| 71:AV:190:LEU:HD11 | 71:AV:226:TYR:CZ  | 2.40                     | 0.56              |
| 79:AA:672:A:H2'    | 79:AA:673:U:C6    | 2.40                     | 0.56              |
| 79:AA:923:A:H2'    | 79:AA:924:A:C8    | 2.39                     | 0.56              |
| 79:AA:1118:A:C3'   | 79:AA:1119:U:H5'' | 2.34                     | 0.56              |
| 79:AA:1431:G:N2    | 79:AA:1457:G:H2'  | 2.21                     | 0.56              |
| 79:AA:1552:G:O2'   | 79:AA:1553:A:H5'  | 2.06                     | 0.56              |
| 79:AA:1564:A:O2'   | 79:AA:1565:A:H5'  | 2.04                     | 0.56              |
| 12:C:152:ALA:CB    | 12:C:289:VAL:HA   | 2.34                     | 0.56              |
| 34:I:197:LEU:HD22  | 33:u:76:LEU:HD12  | 1.86                     | 0.56              |
| 37:d:176:ILE:HD12  | 37:d:181:VAL:HG21 | 1.88                     | 0.56              |
| 84:A4:409:ASP:OD1  | 84:A4:410:PRO:HD2 | 2.06                     | 0.56              |
| 37:d:84:ILE:HA     | 37:d:211:GLN:NE2  | 2.14                     | 0.56              |
| 60:AJ:78:ARG:HH21  | 79:AA:894:C:H41   | 1.53                     | 0.56              |
| 5:4:78:ASP:OD2     | 5:4:94:THR:HG21   | 2.06                     | 0.56              |
| 9:8:154:SER:OG     | 9:8:157:LEU:HD12  | 2.06                     | 0.56              |
| 12:C:152:ALA:HB1   | 12:C:288:ASP:O    | 2.06                     | 0.56              |
| 37:d:138:PRO:HD3   | 37:d:194:VAL:CG2  | 2.35                     | 0.56              |
| 55:AD:420:SER:HA   | 79:AA:929:A:H4'   | 1.86                     | 0.56              |
| 79:AA:1154:A:O2'   | 79:AA:1155:G:H5'  | 2.06                     | 0.56              |
| 79:AA:868:C:H2'    | 79:AA:869:C:H6    | 1.70                     | 0.56              |
| 79:AA:887:G:H2'    | 79:AA:888:U:C6    | 2.41                     | 0.56              |
| 79:AA:1586:G:O2'   | 79:AA:1587:U:H5'  | 2.06                     | 0.56              |
| 11:A:1798:A:N7     | 37:d:37:THR:HA    | 2.21                     | 0.56              |
| 12:C:91:ALA:HB2    | 12:C:108:ILE:CD1  | 2.35                     | 0.56              |
| 79:AA:800:C:O2'    | 79:AA:801:A:H5'   | 2.06                     | 0.56              |
| 79:AA:1168:A:H2'   | 79:AA:1169:G:H5'  | 1.86                     | 0.56              |
| 7:6:57:TYR:CZ      | 29:W:117:ILE:HD11 | 2.41                     | 0.56              |
| 12:C:191:VAL:HG22  | 12:C:253:SER:HA   | 1.86                     | 0.56              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 12:C:193:VAL:HG11  | 12:C:228:ASN:HD21  | 1.71                     | 0.56              |
| 12:C:267:GLN:HG3   | 12:C:297:GLU:HB3   | 1.88                     | 0.56              |
| 37:d:195:VAL:HG23  | 37:d:213:THR:HB    | 1.88                     | 0.56              |
| 63:AM:38:HIS:HE1   | 79:AA:743:C:H4'    | 1.70                     | 0.56              |
| 79:AA:764:A:H4'    | 79:AA:765:C:O4'    | 2.05                     | 0.56              |
| 79:AA:1194:C:O2'   | 79:AA:1195:U:H5'   | 2.06                     | 0.56              |
| 79:AA:1201:A:H2'   | 79:AA:1202:G:C8    | 2.40                     | 0.56              |
| 84:A4:353:ALA:HB1  | 84:A4:375:ILE:HD13 | 1.87                     | 0.56              |
| 52:s:145:VAL:HG21  | 52:s:187:LEU:HD11  | 1.88                     | 0.56              |
| 62:AL:128:ARG:NH2  | 79:AA:1041:A:H3'   | 2.21                     | 0.56              |
| 79:AA:870:C:H5''   | 79:AA:871:A:OP1    | 2.06                     | 0.56              |
| 79:AA:1102:A:H5'   | 79:AA:1576:G:H4'   | 1.86                     | 0.56              |
| 79:AA:1576:G:O2'   | 79:AA:1577:U:H5'   | 2.06                     | 0.56              |
| 8:7:286:LEU:HD11   | 8:7:296:ARG:CB     | 2.36                     | 0.55              |
| 79:AA:1012:A:H2'   | 79:AA:1013:A:C8    | 2.41                     | 0.55              |
| 79:AA:1334:G:H2'   | 79:AA:1335:U:O4'   | 2.06                     | 0.55              |
| 37:d:159:ARG:O     | 37:d:163:LEU:HG    | 2.06                     | 0.55              |
| 38:e:272:VAL:O     | 38:e:276:VAL:HG12  | 2.06                     | 0.55              |
| 79:AA:1209:C:H2'   | 79:AA:1210:U:C6    | 2.40                     | 0.55              |
| 79:AA:1212:U:H2'   | 79:AA:1214:A:OP2   | 2.06                     | 0.55              |
| 79:AA:1362:G:H2'   | 79:AA:1363:C:C6    | 2.41                     | 0.55              |
| 79:AA:1441:A:H2    | 79:AA:1449:G:H22   | 1.54                     | 0.55              |
| 79:AA:1476:G:O2'   | 79:AA:1477:U:H5'   | 2.06                     | 0.55              |
| 84:A4:332:LEU:HD23 | 84:A4:368:SER:HB3  | 1.89                     | 0.55              |
| 74:A0:136:TYR:CZ   | 79:AA:705:C:H2'    | 2.41                     | 0.55              |
| 79:AA:1276:A:C2'   | 79:AA:1277:A:H5'   | 2.36                     | 0.55              |
| 79:AA:1505:A:H2'   | 79:AA:1506:U:C6    | 2.41                     | 0.55              |
| 79:AA:1574:G:O2'   | 79:AA:1575:U:H5'   | 2.07                     | 0.55              |
| 79:AA:1583:MA6:H93 | 79:AA:1584:MA6:C9  | 2.36                     | 0.55              |
| 84:A4:295:ASN:OD1  | 84:A4:334:THR:HG22 | 2.06                     | 0.55              |
| 12:C:133:ASP:O     | 12:C:153:LEU:HD11  | 2.06                     | 0.55              |
| 12:C:201:VAL:HG12  | 12:C:206:ALA:HB2   | 1.88                     | 0.55              |
| 79:AA:753:A:H2'    | 79:AA:754:A:H8     | 1.71                     | 0.55              |
| 12:C:184:ASP:O     | 12:C:260:PHE:HA    | 2.06                     | 0.55              |
| 12:C:203:LEU:HD13  | 12:C:230:PHE:CE1   | 2.41                     | 0.55              |
| 33:G:180:GLU:O     | 33:G:183:LYS:HG3   | 2.06                     | 0.55              |
| 79:AA:699:A:H4'    | 79:AA:851:A:OP1    | 2.06                     | 0.55              |
| 79:AA:740:G:O2'    | 79:AA:741:A:H5'    | 2.06                     | 0.55              |
| 79:AA:1171:A:H2'   | 79:AA:1172:C:O4'   | 2.06                     | 0.55              |
| 12:C:187:GLY:C     | 12:C:239:LEU:HD13  | 2.31                     | 0.55              |
| 12:C:223:ASP:OD2   | 12:C:227:ARG:HG3   | 2.07                     | 0.55              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 78:AY:338:LEU:HD11 | 78:AY:351:MET:HB3  | 1.89                     | 0.55              |
| 79:AA:1215:U:H2'   | 79:AA:1216:C:H5'   | 1.88                     | 0.55              |
| 79:AA:1519:A:H3'   | 79:AA:1519:A:N3    | 2.21                     | 0.55              |
| 86:AX:202:ILE:HD11 | 86:AX:250:GLN:OE1  | 2.07                     | 0.55              |
| 11:A:2919:A:OP1    | 92:A:3470:SPD:H42  | 2.07                     | 0.55              |
| 23:P:112:ILE:HD11  | 23:P:131:VAL:HG11  | 1.88                     | 0.55              |
| 79:AA:832:U:H2'    | 79:AA:833:A:H8     | 1.71                     | 0.55              |
| 79:AA:1498:C:O2'   | 79:AA:1499:U:H5'   | 2.07                     | 0.55              |
| 12:C:196:ARG:NH2   | 12:C:250:GLY:HA2   | 2.22                     | 0.55              |
| 12:C:268:LEU:HB3   | 12:C:272:ASP:CB    | 2.32                     | 0.55              |
| 38:e:183:THR:HG23  | 38:e:186:GLY:N     | 2.22                     | 0.55              |
| 47:q:44:ASP:O      | 47:q:47:THR:HG22   | 2.06                     | 0.55              |
| 47:q:138:GLN:O     | 47:q:141:GLU:HG3   | 2.06                     | 0.55              |
| 79:AA:696:U:H2'    | 79:AA:697:G:C8     | 2.42                     | 0.55              |
| 79:AA:844:A:H2'    | 79:AA:845:A:O4'    | 2.07                     | 0.55              |
| 79:AA:1417:A:H2'   | 79:AA:1418:G:O4'   | 2.05                     | 0.55              |
| 33:G:149:ILE:O     | 33:G:156:ILE:HD11  | 2.06                     | 0.55              |
| 65:AO:82:LYS:NZ    | 79:AA:668:U:H5''   | 2.22                     | 0.55              |
| 79:AA:660:C:O2'    | 79:AA:661:C:H5'    | 2.06                     | 0.55              |
| 79:AA:1130:G:O2'   | 79:AA:1131:C:H5'   | 2.07                     | 0.55              |
| 79:AA:1134:G:O2'   | 79:AA:1135:C:H5'   | 2.07                     | 0.55              |
| 79:AA:1175:G:H2'   | 79:AA:1176:G:C8    | 2.40                     | 0.55              |
| 86:AX:195:ASN:O    | 86:AX:199:LEU:HD13 | 2.07                     | 0.55              |
| 79:AA:732:A:H2'    | 79:AA:733:U:C6     | 2.42                     | 0.55              |
| 79:AA:1348:G:H2'   | 79:AA:1349:U:C6    | 2.42                     | 0.55              |
| 79:AA:1382:A:H2'   | 79:AA:1383:A:O4'   | 2.07                     | 0.55              |
| 79:AA:695:A:C2'    | 79:AA:696:U:H5'    | 2.37                     | 0.54              |
| 86:AX:159:HIS:HA   | 86:AX:162:VAL:HG12 | 1.89                     | 0.54              |
| 12:C:122:ILE:HA    | 12:C:125:ALA:HB2   | 1.88                     | 0.54              |
| 79:AA:1033:U:H2'   | 79:AA:1034:U:H6    | 1.72                     | 0.54              |
| 79:AA:1168:A:C2'   | 79:AA:1169:G:H5'   | 2.37                     | 0.54              |
| 79:AA:1237:A:H5'   | 79:AA:1238:C:OP2   | 2.06                     | 0.54              |
| 79:AA:1248:C:O2'   | 79:AA:1249:U:H5'   | 2.06                     | 0.54              |
| 79:AA:1555:A:H2'   | 79:AA:1556:C:O4'   | 2.07                     | 0.54              |
| 37:d:88:TYR:OH     | 37:d:195:VAL:HB    | 2.07                     | 0.54              |
| 92:AG:401:SPD:H41  | 92:AA:1785:SPD:C5  | 2.36                     | 0.54              |
| 79:AA:680:U:O2'    | 79:AA:681:U:H5'    | 2.07                     | 0.54              |
| 79:AA:1396:C:O2'   | 79:AA:1397:U:H5'   | 2.06                     | 0.54              |
| 79:AA:676:G:O2'    | 79:AA:677:C:H5'    | 2.07                     | 0.54              |
| 79:AA:819:A:C2'    | 79:AA:820:G:H5'    | 2.38                     | 0.54              |
| 79:AA:829:C:H1'    | 79:AA:857:G:H22    | 1.72                     | 0.54              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 80:AI:88:ILE:HD12  | 80:AI:149:VAL:HG13 | 1.89                     | 0.54              |
| 12:C:132:LYS:O     | 12:C:155:ASN:HA    | 2.08                     | 0.54              |
| 33:t:86:LEU:CD2    | 33:u:68:VAL:HG22   | 2.38                     | 0.54              |
| 71:AV:229:ALA:HB1  | 71:AV:286:VAL:HG11 | 1.90                     | 0.54              |
| 79:AA:672:A:H2'    | 79:AA:673:U:H6     | 1.72                     | 0.54              |
| 79:AA:702:C:H2'    | 79:AA:703:A:O4'    | 2.07                     | 0.54              |
| 79:AA:964:C:O2'    | 79:AA:965:C:H5'    | 2.07                     | 0.54              |
| 79:AA:1202:G:H2'   | 79:AA:1203:C:H6    | 1.73                     | 0.54              |
| 79:AA:1399:A:H2'   | 79:AA:1400:U:H6    | 1.73                     | 0.54              |
| 79:AA:1469:G:O2'   | 79:AA:1470:A:H5'   | 2.06                     | 0.54              |
| 79:AA:1579:C:O2'   | 79:AA:1580:U:H5'   | 2.07                     | 0.54              |
| 12:C:77:ARG:O      | 12:C:80:ILE:HG22   | 2.07                     | 0.54              |
| 44:m:58:LYS:NZ     | 44:m:64:ILE:HG23   | 2.23                     | 0.54              |
| 78:AY:305:THR:HG22 | 84:A4:67:LYS:NZ    | 2.22                     | 0.54              |
| 79:AA:1173:C:H2'   | 79:AA:1174:U:C6    | 2.42                     | 0.54              |
| 12:C:110:GLU:HA    | 12:C:113:ARG:HD3   | 1.90                     | 0.54              |
| 79:AA:823:A:O2'    | 79:AA:824:U:H5'    | 2.08                     | 0.54              |
| 79:AA:923:A:H2'    | 79:AA:924:A:H8     | 1.73                     | 0.54              |
| 79:AA:944:U:H2'    | 79:AA:945:G:C8     | 2.43                     | 0.54              |
| 79:AA:1408:A:H5'   | 79:AA:1446:A:HO2'  | 1.72                     | 0.54              |
| 79:AA:1595:G:H2'   | 79:AA:1596:A:H8    | 1.73                     | 0.54              |
| 84:A4:533:MET:HE2  | 84:A4:574:THR:HG21 | 1.88                     | 0.54              |
| 87:A2:33:VAL:HG22  | 87:A2:105:ASN:OD1  | 2.08                     | 0.54              |
| 33:G:148:GLU:O     | 33:G:152:TYR:HB3   | 2.07                     | 0.54              |
| 33:G:188:LEU:HD13  | 33:G:195:VAL:HG23  | 1.89                     | 0.54              |
| 79:AA:661:C:H2'    | 79:AA:662:U:C6     | 2.41                     | 0.54              |
| 79:AA:685:A:O2'    | 79:AA:686:A:H5'    | 2.08                     | 0.54              |
| 79:AA:706:C:H2'    | 79:AA:707:C:O4'    | 2.08                     | 0.54              |
| 79:AA:834:G:H2'    | 79:AA:835:C:O4'    | 2.08                     | 0.54              |
| 79:AA:1233:C:H2'   | 79:AA:1233:C:O2    | 2.06                     | 0.54              |
| 79:AA:1376:C:H4'   | 79:AA:1377:C:C5'   | 2.38                     | 0.54              |
| 7:6:206:TYR:HH     | 7:6:214:TRP:CD1    | 2.25                     | 0.54              |
| 12:C:152:ALA:HA    | 12:C:290:ILE:HG12  | 1.90                     | 0.54              |
| 12:C:192:GLU:HG2   | 12:C:194:GLU:H     | 1.73                     | 0.54              |
| 79:AA:681:U:H2'    | 79:AA:682:A:H8     | 1.73                     | 0.54              |
| 79:AA:1146:C:H2'   | 79:AA:1147:G:H8    | 1.73                     | 0.54              |
| 79:AA:1394:C:O2'   | 79:AA:1395:C:H5'   | 2.07                     | 0.54              |
| 79:AA:664:G:H2'    | 79:AA:665:C:H6     | 1.71                     | 0.54              |
| 79:AA:887:G:H2'    | 79:AA:888:U:O4'    | 2.08                     | 0.54              |
| 79:AA:926:A:O2'    | 79:AA:927:G:H5'    | 2.08                     | 0.54              |
| 79:AA:1181:G:H2'   | 79:AA:1182:C:H6    | 1.72                     | 0.54              |

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| Atom-1            | Atom-2              | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|---------------------|--------------------------|-------------------|
| 79:AA:1304:C:H2'  | 79:AA:1305:A:H5'    | 1.90                     | 0.54              |
| 12:C:203:LEU:HD13 | 12:C:230:PHE:HE1    | 1.72                     | 0.53              |
| 12:C:216:GLU:HB3  | 12:C:233:ILE:O      | 2.08                     | 0.53              |
| 33:G:168:LEU:HD23 | 33:G:170:GLN:HE21   | 1.71                     | 0.53              |
| 33:G:185:LYS:O    | 33:G:188:LEU:HG     | 2.08                     | 0.53              |
| 79:AA:1003:A:H2'  | 79:AA:1004:G:H8     | 1.72                     | 0.53              |
| 79:AA:1408:A:O2'  | 79:AA:1409:A:H5'    | 2.08                     | 0.53              |
| 28:U:144:ARG:O    | 37:d:276:ILE:HG21   | 2.08                     | 0.53              |
| 77:Az:0:U:O2      | 79:AA:993:A:H4'     | 2.08                     | 0.53              |
| 79:AA:775:C:H2'   | 79:AA:776:A:H5'     | 1.90                     | 0.53              |
| 79:AA:1218:A:H2'  | 79:AA:1219:U:O4'    | 2.07                     | 0.53              |
| 79:AA:1407:U:H2'  | 79:AA:1408:A:H8     | 1.72                     | 0.53              |
| 79:AA:1505:A:H2'  | 79:AA:1506:U:H6     | 1.73                     | 0.53              |
| 33:u:81:ASP:O     | 33:u:85:LEU:HD23    | 2.07                     | 0.53              |
| 79:AA:868:C:O2'   | 79:AA:869:C:H5'     | 2.08                     | 0.53              |
| 79:AA:1025:A:H2'  | 79:AA:1026:A:H8     | 1.71                     | 0.53              |
| 79:AA:1395:C:O2'  | 79:AA:1396:C:H5'    | 2.08                     | 0.53              |
| 79:AA:1517:A:H3'  | 79:AA:1518:C:C6     | 2.43                     | 0.53              |
| 12:C:75:VAL:HG12  | 12:C:78:SER:HB3     | 1.89                     | 0.53              |
| 79:AA:659:U:H2'   | 79:AA:660:C:H6      | 1.72                     | 0.53              |
| 79:AA:842:C:H2'   | 79:AA:843:G:H8      | 1.72                     | 0.53              |
| 79:AA:887:G:O2'   | 79:AA:888:U:H5'     | 2.09                     | 0.53              |
| 79:AA:1592:U:H2'  | 79:AA:1593:U:C6     | 2.44                     | 0.53              |
| 12:C:211:ILE:HD13 | 33:G:147:LYS:CG     | 2.39                     | 0.53              |
| 47:q:154:ALA:HA   | 47:q:157:GLN:CD     | 2.34                     | 0.53              |
| 47:q:192:GLU:O    | 47:q:196:LYS:HG3    | 2.09                     | 0.53              |
| 70:AU:64:ARG:HA   | 70:AU:67:VAL:HG12   | 1.90                     | 0.53              |
| 71:AV:355:LEU:O   | 71:AV:359:LEU:HD23  | 2.09                     | 0.53              |
| 79:AA:1014:A:H4'  | 80:AI:184:ASN:CB    | 2.38                     | 0.53              |
| 79:AA:1131:C:O2'  | 79:AA:1132:U:H5'    | 2.09                     | 0.53              |
| 75:A1:60:MET:HE1  | 75:A1:66:TRP:HZ3    | 1.74                     | 0.53              |
| 79:AA:661:C:H2'   | 79:AA:662:U:H6      | 1.73                     | 0.53              |
| 79:AA:1163:C:H2'  | 79:AA:1164:U:H5'    | 1.89                     | 0.53              |
| 79:AA:1265:C:O2'  | 79:AA:1266:A:H5'    | 2.08                     | 0.53              |
| 12:C:209:MET:HE3  | 12:C:209:MET:O      | 2.08                     | 0.53              |
| 37:d:91:PRO:HB2   | 37:d:94:ASP:HB2     | 1.90                     | 0.53              |
| 59:AH:158:GLU:OE1 | 84:A4:70:VAL:HG11   | 2.08                     | 0.53              |
| 79:AA:983:C:H2'   | 79:AA:984:C:H6      | 1.74                     | 0.53              |
| 79:AA:1044:U:OP1  | 98:AA:1702:SPM:H121 | 2.08                     | 0.53              |
| 79:AA:1128:C:O2'  | 79:AA:1129:U:H5'    | 2.09                     | 0.53              |
| 79:AA:1412:G:H2'  | 79:AA:1413:U:O4'    | 2.09                     | 0.53              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 79:AA:1470:A:O2'  | 79:AA:1471:A:H5'   | 2.08                     | 0.53              |
| 12:C:82:SER:O     | 12:C:86:LEU:HG     | 2.09                     | 0.53              |
| 33:u:74:LEU:HD23  | 33:u:79:ILE:HG12   | 1.89                     | 0.53              |
| 79:AA:664:G:H2'   | 79:AA:665:C:C6     | 2.43                     | 0.53              |
| 79:AA:871:A:H1'   | 79:AA:872:G:C8     | 2.44                     | 0.53              |
| 79:AA:1058:C:O2'  | 79:AA:1059:U:H5'   | 2.09                     | 0.53              |
| 79:AA:1496:U:H2'  | 79:AA:1497:C:C6    | 2.44                     | 0.53              |
| 12:C:217:ASP:HA   | 33:G:143:VAL:HG21  | 1.90                     | 0.53              |
| 33:G:163:LYS:HA   | 33:G:166:GLU:CD    | 2.33                     | 0.53              |
| 63:AM:82:HIS:C    | 63:AM:83:LEU:HD22  | 2.34                     | 0.53              |
| 79:AA:1265:C:H2'  | 79:AA:1266:A:H8    | 1.74                     | 0.53              |
| 79:AA:1374:A:H2'  | 79:AA:1375:C:C6    | 2.44                     | 0.53              |
| 79:AA:1510:U:O2'  | 79:AA:1511:C:H5'   | 2.08                     | 0.53              |
| 79:AA:865:A:H2'   | 79:AA:866:A:O4'    | 2.09                     | 0.53              |
| 79:AA:884:U:H2'   | 79:AA:885:U:C6     | 2.43                     | 0.53              |
| 79:AA:1047:A:C5   | 79:AA:1158:U:H4'   | 2.44                     | 0.53              |
| 12:C:76:GLU:OE2   | 12:C:77:ARG:HG2    | 2.09                     | 0.52              |
| 18:K:93:ALA:O     | 18:K:97:LEU:HD23   | 2.08                     | 0.52              |
| 33:G:141:ASP:O    | 33:G:144:LYS:HB2   | 2.09                     | 0.52              |
| 47:q:176:GLN:HA   | 47:q:179:LEU:HD21  | 1.89                     | 0.52              |
| 68:AS:84:ALA:HB3  | 72:AW:101:ILE:HD11 | 1.91                     | 0.52              |
| 89:k:10:LEU:HD11  | 89:k:42:VAL:HG12   | 1.91                     | 0.52              |
| 6:5:165:GLN:NE2   | 6:5:175:THR:HG22   | 2.25                     | 0.52              |
| 12:C:75:VAL:CG1   | 12:C:78:SER:HB3    | 2.39                     | 0.52              |
| 12:C:185:LYS:HD2  | 12:C:258:LEU:HB3   | 1.91                     | 0.52              |
| 33:G:145:LEU:HD21 | 33:G:192:GLY:C     | 2.34                     | 0.52              |
| 33:G:188:LEU:O    | 33:G:191:VAL:HG12  | 2.09                     | 0.52              |
| 51:p:86:GLY:HA3   | 51:p:93:ASN:CG     | 2.34                     | 0.52              |
| 79:AA:728:C:H2'   | 79:AA:729:U:C6     | 2.44                     | 0.52              |
| 79:AA:740:G:H2'   | 79:AA:741:A:H8     | 1.74                     | 0.52              |
| 79:AA:869:C:H3'   | 79:AA:870:C:C5     | 2.44                     | 0.52              |
| 79:AA:1204:C:O2'  | 79:AA:1205:U:H5'   | 2.09                     | 0.52              |
| 79:AA:1322:C:H2'  | 79:AA:1323:G:O4'   | 2.09                     | 0.52              |
| 79:AA:1471:A:H2'  | 79:AA:1472:G:H8    | 1.74                     | 0.52              |
| 79:AA:1554:G:O2'  | 79:AA:1555:A:H5'   | 2.09                     | 0.52              |
| 86:AX:151:LEU:O   | 86:AX:258:LEU:HD12 | 2.09                     | 0.52              |
| 12:C:208:GLU:OE2  | 33:G:158:LEU:HD21  | 2.09                     | 0.52              |
| 47:q:193:GLU:HA   | 47:q:196:LYS:HD2   | 1.92                     | 0.52              |
| 79:AA:957:C:H2'   | 79:AA:958:C:C5     | 2.44                     | 0.52              |
| 79:AA:993:A:O2'   | 79:AA:994:A:H5'    | 2.09                     | 0.52              |
| 79:AA:1174:U:O2'  | 79:AA:1175:G:H5'   | 2.08                     | 0.52              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1202:G:H2'   | 79:AA:1203:C:C6    | 2.44                     | 0.52              |
| 79:AA:1283:A:H3'   | 79:AA:1284:U:C5'   | 2.40                     | 0.52              |
| 12:C:207:LEU:HD13  | 33:G:158:LEU:CD1   | 2.39                     | 0.52              |
| 12:C:208:GLU:OE1   | 33:G:158:LEU:HD21  | 2.09                     | 0.52              |
| 24:Q:240:ILE:HG21  | 24:Q:243:ILE:HD12  | 1.90                     | 0.52              |
| 48:r:99:MET:HE1    | 48:r:115:ILE:HG22  | 1.91                     | 0.52              |
| 51:p:54:GLY:O      | 51:p:57:THR:HG22   | 2.09                     | 0.52              |
| 54:AC:132:TYR:O    | 54:AC:136:VAL:HG23 | 2.09                     | 0.52              |
| 79:AA:709:G:O2'    | 79:AA:710:U:H5'    | 2.09                     | 0.52              |
| 79:AA:891:C:H2'    | 79:AA:892:A:O4'    | 2.10                     | 0.52              |
| 79:AA:1410:G:O2'   | 79:AA:1411:G:H5'   | 2.10                     | 0.52              |
| 79:AA:1580:U:O2'   | 79:AA:1581:G:H5'   | 2.09                     | 0.52              |
| 33:G:132:VAL:HG11  | 33:G:184:ILE:HD11  | 1.92                     | 0.52              |
| 33:G:186:ALA:HA    | 33:G:189:GLU:OE2   | 2.10                     | 0.52              |
| 61:AK:127:THR:OG1  | 79:AA:1309:A:H1'   | 2.09                     | 0.52              |
| 79:AA:775:C:C2'    | 79:AA:776:A:H5'    | 2.40                     | 0.52              |
| 1:O:128:GLU:OE2    | 37:d:289:PRO:HG2   | 2.09                     | 0.52              |
| 33:G:189:GLU:HA    | 33:G:193:GLY:O     | 2.09                     | 0.52              |
| 74:A0:184:THR:O    | 74:A0:184:THR:HG23 | 2.10                     | 0.52              |
| 79:AA:1118:A:H3'   | 79:AA:1119:U:C5'   | 2.38                     | 0.52              |
| 79:AA:1174:U:H2'   | 79:AA:1175:G:C8    | 2.44                     | 0.52              |
| 79:AA:1240:A:H2'   | 79:AA:1241:C:H6    | 1.74                     | 0.52              |
| 18:K:15:ALA:HB3    | 49:c:269:LEU:HD22  | 1.90                     | 0.52              |
| 79:AA:1188:A:H4'   | 79:AA:1189:U:H5'   | 1.91                     | 0.52              |
| 79:AA:1240:A:H2'   | 79:AA:1241:C:C6    | 2.44                     | 0.52              |
| 12:C:89:ARG:CD     | 12:C:133:ASP:HB3   | 2.39                     | 0.52              |
| 79:AA:761:A:H4'    | 79:AA:761:A:OP1    | 2.10                     | 0.52              |
| 79:AA:980:U:O2'    | 79:AA:981:C:H5'    | 2.10                     | 0.52              |
| 79:AA:1006:U:H2'   | 79:AA:1007:G:H8    | 1.74                     | 0.52              |
| 79:AA:1507:A:H2'   | 79:AA:1508:C:C6    | 2.42                     | 0.52              |
| 79:AA:1592:U:O2'   | 79:AA:1593:U:H5'   | 2.10                     | 0.52              |
| 12:C:267:GLN:C     | 12:C:268:LEU:HD12  | 2.34                     | 0.52              |
| 14:E:196:ALA:HB3   | 14:E:319:TYR:CD2   | 2.45                     | 0.52              |
| 79:AA:1181:G:H2'   | 79:AA:1182:C:C6    | 2.45                     | 0.52              |
| 79:AA:1401:G:H22   | 79:AA:1403:A:H3'   | 1.72                     | 0.52              |
| 71:AV:70:LEU:HD23  | 71:AV:393:GLU:OE1  | 2.09                     | 0.52              |
| 71:AV:384:LEU:HD12 | 71:AV:385:ASP:N    | 2.25                     | 0.52              |
| 78:AY:297:GLY:O    | 78:AY:301:LEU:HD23 | 2.10                     | 0.52              |
| 79:AA:1309:A:H2'   | 79:AA:1310:C:C6    | 2.45                     | 0.52              |
| 79:AA:1435:A:O2'   | 79:AA:1436:C:H5'   | 2.09                     | 0.52              |
| 79:AA:1500:C:O2'   | 79:AA:1501:A:H5'   | 2.10                     | 0.52              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 16:H:248:TYR:CD2   | 16:H:252:LEU:HD23  | 2.44                     | 0.51              |
| 79:AA:1461:A:H4'   | 79:AA:1462:G:N7    | 2.25                     | 0.51              |
| 79:AA:1471:A:H2'   | 79:AA:1472:G:C8    | 2.45                     | 0.51              |
| 79:AA:1596:A:O2'   | 79:AA:1597:C:H5'   | 2.10                     | 0.51              |
| 6:5:167:THR:HG21   | 52:s:281:HIS:NE2   | 2.24                     | 0.51              |
| 33:G:186:ALA:O     | 33:G:189:GLU:HG2   | 2.11                     | 0.51              |
| 47:q:154:ALA:HA    | 47:q:157:GLN:OE1   | 2.10                     | 0.51              |
| 68:AS:106:LEU:HD13 | 68:AS:120:GLU:HG3  | 1.92                     | 0.51              |
| 79:AA:798:C:H2'    | 79:AA:799:A:C8     | 2.46                     | 0.51              |
| 79:AA:996:A:H2'    | 79:AA:997:A:C8     | 2.45                     | 0.51              |
| 79:AA:1182:C:O2'   | 79:AA:1183:U:H5'   | 2.09                     | 0.51              |
| 79:AA:1315:G:H2'   | 79:AA:1316:U:C6    | 2.46                     | 0.51              |
| 12:C:217:ASP:HB3   | 12:C:219:LYS:HZ3   | 1.75                     | 0.51              |
| 79:AA:1353:A:H5'   | 79:AA:1354:A:O5'   | 2.10                     | 0.51              |
| 79:AA:1450:C:H2'   | 79:AA:1451:U:C6    | 2.45                     | 0.51              |
| 79:AA:1472:G:O2'   | 79:AA:1473:C:H5'   | 2.10                     | 0.51              |
| 12:C:211:ILE:HD12  | 33:G:143:VAL:CG1   | 2.16                     | 0.51              |
| 33:t:86:LEU:HD21   | 33:u:68:VAL:HG22   | 1.92                     | 0.51              |
| 79:AA:663:A:H2'    | 79:AA:664:G:H8     | 1.72                     | 0.51              |
| 86:AX:152:ILE:O    | 86:AX:153:LEU:HD22 | 2.11                     | 0.51              |
| 12:C:126:LEU:O     | 12:C:130:LYS:HD3   | 2.10                     | 0.51              |
| 12:C:180:ARG:HH12  | 12:C:181:HIS:HB3   | 1.76                     | 0.51              |
| 12:C:268:LEU:HD13  | 12:C:296:ILE:HD13  | 1.93                     | 0.51              |
| 79:AA:1089:U:H2'   | 79:AA:1090:A:C8    | 2.42                     | 0.51              |
| 79:AA:1240:A:O2'   | 79:AA:1241:C:H5'   | 2.09                     | 0.51              |
| 79:AA:1256:A:O2'   | 79:AA:1257:U:H5'   | 2.09                     | 0.51              |
| 79:AA:1271:C:O2    | 79:AA:1271:C:H2'   | 2.09                     | 0.51              |
| 79:AA:1505:A:O2'   | 79:AA:1506:U:H5'   | 2.10                     | 0.51              |
| 84:A4:266:MET:HG2  | 84:A4:271:ALA:HB3  | 1.92                     | 0.51              |
| 12:C:143:PRO:O     | 12:C:268:LEU:HD21  | 2.10                     | 0.51              |
| 12:C:209:MET:SD    | 12:C:249:LEU:HB3   | 2.50                     | 0.51              |
| 50:f:90:VAL:HG13   | 50:f:189:HIS:HB3   | 1.92                     | 0.51              |
| 79:AA:1495:C:O2'   | 79:AA:1496:U:H5'   | 2.11                     | 0.51              |
| 79:AA:1498:C:H2'   | 79:AA:1499:U:H6    | 1.75                     | 0.51              |
| 84:A4:556:LYS:CE   | 84:A4:579:ILE:HD13 | 2.40                     | 0.51              |
| 86:AX:99:LEU:HD21  | 86:AX:140:HIS:HB2  | 1.93                     | 0.51              |
| 8:7:223:ALA:O      | 8:7:227:LEU:HD23   | 2.11                     | 0.51              |
| 71:AV:113:ILE:HG21 | 71:AV:143:THR:CG2  | 2.40                     | 0.51              |
| 74:A0:99:ARG:HD3   | 79:AA:1526:U:H2'   | 1.91                     | 0.51              |
| 79:AA:1085:C:O2'   | 79:AA:1086:C:H5'   | 2.11                     | 0.51              |
| 79:AA:1130:G:H2'   | 79:AA:1131:C:C6    | 2.45                     | 0.51              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1370:U:O2    | 79:AA:1370:U:H2'   | 2.10                     | 0.51              |
| 79:AA:1527:A:H2'   | 79:AA:1528:A:O4'   | 2.10                     | 0.51              |
| 17:J:164:LEU:HD23  | 43:l:69:THR:HG23   | 1.92                     | 0.51              |
| 42:j:89:GLN:O      | 42:j:93:LEU:HD23   | 2.11                     | 0.51              |
| 67:AR:74:GLU:O     | 67:AR:78:ILE:HD12  | 2.11                     | 0.51              |
| 67:AR:253:ILE:HG21 | 67:AR:271:MET:SD   | 2.51                     | 0.51              |
| 68:AS:50:ARG:NH2   | 79:AA:1119:U:H5'   | 2.26                     | 0.51              |
| 68:AS:51:VAL:HG13  | 87:A2:117:LEU:HD11 | 1.92                     | 0.51              |
| 79:AA:1066:C:O2'   | 79:AA:1067:A:H5'   | 2.11                     | 0.51              |
| 79:AA:1078:A:H5'   | 83:Ax:36:C:OP1     | 2.10                     | 0.51              |
| 79:AA:1351:G:O2'   | 79:AA:1352:C:H5'   | 2.10                     | 0.51              |
| 79:AA:1561:C:H2'   | 79:AA:1562:G:O4'   | 2.11                     | 0.51              |
| 6:5:236:LEU:HD22   | 6:5:420:HIS:ND1    | 2.26                     | 0.51              |
| 33:G:146:ILE:HD11  | 33:G:162:LYS:HA    | 1.91                     | 0.51              |
| 57:AF:166:ARG:NH2  | 79:AA:994:A:H1'    | 2.25                     | 0.51              |
| 75:A1:126:LEU:HD11 | 84:A4:70:VAL:HG13  | 1.92                     | 0.51              |
| 79:AA:808:C:H2'    | 79:AA:809:G:H5'    | 1.92                     | 0.51              |
| 79:AA:1047:A:C2'   | 79:AA:1048:C:H5'   | 2.41                     | 0.51              |
| 79:AA:1114:U:O2'   | 79:AA:1115:U:H5'   | 2.11                     | 0.51              |
| 79:AA:1122:A:H2'   | 79:AA:1123:C:C6    | 2.45                     | 0.51              |
| 84:A4:466:CYS:SG   | 84:A4:496:LEU:HD22 | 2.51                     | 0.51              |
| 24:Q:100:LEU:HD21  | 24:Q:286:ILE:HG12  | 1.93                     | 0.51              |
| 37:d:94:ASP:HB3    | 37:d:269:TRP:CH2   | 2.46                     | 0.51              |
| 38:e:50:ALA:HB2    | 38:e:231:VAL:CG1   | 2.41                     | 0.51              |
| 55:AD:323:ILE:HG21 | 55:AD:349:LEU:HD23 | 1.92                     | 0.51              |
| 79:AA:821:U:H2'    | 79:AA:822:G:H8     | 1.76                     | 0.51              |
| 79:AA:896:A:H2'    | 79:AA:897:C:C6     | 2.46                     | 0.51              |
| 79:AA:945:G:O6     | 98:AA:1702:SPM:H22 | 2.10                     | 0.51              |
| 79:AA:1358:A:H2'   | 79:AA:1359:U:H6    | 1.74                     | 0.51              |
| 79:AA:1503:G:H2'   | 79:AA:1504:U:C6    | 2.46                     | 0.51              |
| 8:7:77:THR:HG23    | 37:d:283:PRO:HA    | 1.92                     | 0.50              |
| 12:C:128:MET:HG2   | 12:C:129:GLU:OE1   | 2.12                     | 0.50              |
| 33:G:145:LEU:CD2   | 33:G:191:VAL:HG13  | 2.41                     | 0.50              |
| 47:q:145:LYS:HZ1   | 47:q:149:ASP:HB2   | 1.75                     | 0.50              |
| 79:AA:747:A:H2'    | 79:AA:748:G:H8     | 1.72                     | 0.50              |
| 79:AA:818:C:H2'    | 79:AA:819:A:H8     | 1.75                     | 0.50              |
| 79:AA:852:A:H3'    | 79:AA:853:C:C6     | 2.43                     | 0.50              |
| 79:AA:1454:G:O2'   | 79:AA:1455:U:H5'   | 2.11                     | 0.50              |
| 37:d:137:PHE:HE2   | 37:d:212:ILE:HB    | 1.76                     | 0.50              |
| 50:f:131:THR:HG23  | 50:f:131:THR:O     | 2.12                     | 0.50              |
| 70:AU:79:GLN:OE1   | 79:AA:740:G:H1'    | 2.12                     | 0.50              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:751:A:O2'    | 79:AA:752:C:H5'    | 2.10                     | 0.50              |
| 79:AA:799:A:H2'    | 79:AA:800:C:H6     | 1.76                     | 0.50              |
| 79:AA:875:U:O2'    | 79:AA:876:U:H5'    | 2.11                     | 0.50              |
| 37:d:129:ASP:OD2   | 37:d:132:PHE:HB2   | 2.11                     | 0.50              |
| 37:d:235:GLN:NE2   | 37:d:238:VAL:HG11  | 2.26                     | 0.50              |
| 79:AA:709:G:H2'    | 79:AA:710:U:O4'    | 2.10                     | 0.50              |
| 9:8:192:TYR:HE1    | 50:f:134:VAL:HG22  | 1.77                     | 0.50              |
| 11:A:3170:C:N4     | 11:A:3171:C:H41    | 2.10                     | 0.50              |
| 12:C:271:PRO:O     | 12:C:274:GLU:HG3   | 2.11                     | 0.50              |
| 59:AH:72:LEU:HD12  | 75:A1:133:TRP:CZ3  | 2.47                     | 0.50              |
| 79:AA:986:G:O2'    | 79:AA:987:A:H5'    | 2.11                     | 0.50              |
| 33:G:188:LEU:HA    | 33:G:191:VAL:HG12  | 1.94                     | 0.50              |
| 43:l:96:LEU:O      | 43:l:96:LEU:HD23   | 2.10                     | 0.50              |
| 59:AH:155:VAL:HG13 | 75:A1:126:LEU:HD12 | 1.92                     | 0.50              |
| 79:AA:1537:C:H4'   | 79:AA:1538:G:O5'   | 2.10                     | 0.50              |
| 5:4:103:MET:HE1    | 11:A:2952:U:C5'    | 2.39                     | 0.50              |
| 12:C:160:CYS:O     | 12:C:164:ILE:HG12  | 2.12                     | 0.50              |
| 55:AD:393:LYS:O    | 67:AR:107:THR:HG21 | 2.11                     | 0.50              |
| 71:AV:205:GLY:O    | 71:AV:209:LEU:HD23 | 2.11                     | 0.50              |
| 79:AA:1103:A:H4'   | 79:AA:1105:C:C5    | 2.47                     | 0.50              |
| 79:AA:1530:A:H2'   | 79:AA:1531:C:C6    | 2.46                     | 0.50              |
| 21:N:59:VAL:HG13   | 21:N:59:VAL:O      | 2.12                     | 0.50              |
| 37:d:121:SER:O     | 37:d:125:ILE:HG13  | 2.11                     | 0.50              |
| 37:d:222:LEU:HD12  | 37:d:223:ALA:N     | 2.27                     | 0.50              |
| 70:AU:27:ARG:HB2   | 79:AA:712:C:H42    | 1.77                     | 0.50              |
| 79:AA:1117:A:H2'   | 79:AA:1118:A:H5'   | 1.92                     | 0.50              |
| 79:AA:1577:U:H2'   | 79:AA:1578:A:C8    | 2.47                     | 0.50              |
| 55:AD:164:GLU:O    | 55:AD:168:VAL:HG23 | 2.12                     | 0.50              |
| 63:AM:65:LEU:HD12  | 69:AT:146:GLN:NE2  | 2.27                     | 0.50              |
| 79:AA:1043:C:O2'   | 79:AA:1044:U:H5'   | 2.11                     | 0.50              |
| 79:AA:1396:C:H2'   | 79:AA:1397:U:H6    | 1.76                     | 0.50              |
| 79:AA:1399:A:O2'   | 79:AA:1400:U:H5'   | 2.12                     | 0.50              |
| 86:AX:78:VAL:HG13  | 86:AX:79:PHE:CD2   | 2.47                     | 0.50              |
| 8:7:286:LEU:HD11   | 8:7:296:ARG:HB2    | 1.94                     | 0.50              |
| 16:H:185:ASN:C     | 16:H:208:LEU:HD11  | 2.37                     | 0.50              |
| 59:AH:145:LEU:HB3  | 59:AH:148:LEU:HD11 | 1.94                     | 0.50              |
| 59:AH:155:VAL:HG21 | 75:A1:129:PHE:CB   | 2.42                     | 0.50              |
| 71:AV:190:LEU:HD11 | 71:AV:226:TYR:CE1  | 2.47                     | 0.50              |
| 79:AA:1043:C:H2'   | 79:AA:1044:U:C6    | 2.46                     | 0.50              |
| 12:C:227:ARG:CZ    | 12:C:229:VAL:HG12  | 2.42                     | 0.49              |
| 33:G:145:LEU:HD22  | 33:G:191:VAL:HG13  | 1.94                     | 0.49              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 33:G:188:LEU:HD22  | 33:G:195:VAL:CG2   | 2.42                     | 0.49              |
| 33:G:197:LEU:HD12  | 33:G:197:LEU:O     | 2.12                     | 0.49              |
| 35:V:188:VAL:O     | 35:V:188:VAL:HG23  | 2.12                     | 0.49              |
| 37:d:88:TYR:CZ     | 37:d:195:VAL:HB    | 2.46                     | 0.49              |
| 79:AA:1177:C:H2'   | 79:AA:1178:G:C8    | 2.45                     | 0.49              |
| 4:3:110:VAL:HG21   | 4:3:161:MET:HE3    | 1.93                     | 0.49              |
| 12:C:166:HIS:HB3   | 12:C:170:LYS:NZ    | 2.27                     | 0.49              |
| 12:C:223:ASP:HB3   | 12:C:229:VAL:CG1   | 2.40                     | 0.49              |
| 16:H:102:VAL:CG1   | 16:H:105:VAL:HG22  | 2.42                     | 0.49              |
| 50:f:80:ILE:HG23   | 50:f:90:VAL:HG12   | 1.94                     | 0.49              |
| 62:AL:209:LEU:HD12 | 76:A3:189:TRP:NE1  | 2.27                     | 0.49              |
| 63:AM:77:ILE:HD11  | 63:AM:83:LEU:HD21  | 1.94                     | 0.49              |
| 71:AV:227:GLY:O    | 71:AV:231:LEU:HD23 | 2.12                     | 0.49              |
| 71:AV:360:VAL:HG13 | 71:AV:364:LEU:HD22 | 1.94                     | 0.49              |
| 79:AA:968:U:H2'    | 79:AA:969:A:C8     | 2.47                     | 0.49              |
| 84:A4:88:VAL:HG11  | 84:A4:107:LEU:HD11 | 1.93                     | 0.49              |
| 34:I:197:LEU:HD23  | 34:I:198:PRO:O     | 2.12                     | 0.49              |
| 79:AA:737:C:N3     | 79:AA:738:A:H1'    | 2.26                     | 0.49              |
| 79:AA:1026:A:O2'   | 79:AA:1027:A:H5'   | 2.12                     | 0.49              |
| 79:AA:1161:A:O2'   | 79:AA:1162:A:H5'   | 2.11                     | 0.49              |
| 79:AA:1202:G:H2'   | 79:AA:1203:C:O4'   | 2.12                     | 0.49              |
| 79:AA:1371:U:O2'   | 79:AA:1372:C:H5'   | 2.12                     | 0.49              |
| 79:AA:1395:C:H2'   | 79:AA:1396:C:H6    | 1.78                     | 0.49              |
| 83:Ax:18:A:H61     | 83:Ax:43:A:H2'     | 1.77                     | 0.49              |
| 12:C:107:ASN:O     | 12:C:111:VAL:HG23  | 2.12                     | 0.49              |
| 12:C:205:ARG:HA    | 12:C:208:GLU:CG    | 2.43                     | 0.49              |
| 12:C:211:ILE:HD13  | 33:G:147:LYS:HG2   | 1.94                     | 0.49              |
| 33:G:184:ILE:HG13  | 33:G:185:LYS:N     | 2.27                     | 0.49              |
| 79:AA:726:C:O2'    | 79:AA:727:U:H5'    | 2.12                     | 0.49              |
| 79:AA:959:C:H3'    | 79:AA:960:C:C5'    | 2.42                     | 0.49              |
| 79:AA:1190:C:O2'   | 79:AA:1191:C:H5'   | 2.13                     | 0.49              |
| 79:AA:1213:A:H1'   | 79:AA:1239:C:O2'   | 2.13                     | 0.49              |
| 79:AA:1527:A:H2'   | 79:AA:1528:A:C4'   | 2.43                     | 0.49              |
| 79:AA:1530:A:H2'   | 79:AA:1531:C:O4'   | 2.12                     | 0.49              |
| 84:A4:494:ILE:HD11 | 84:A4:527:LEU:HA   | 1.93                     | 0.49              |
| 12:C:241:GLN:O     | 12:C:244:LYS:HG2   | 2.13                     | 0.49              |
| 79:AA:790:A:H2'    | 79:AA:791:G:H4'    | 1.93                     | 0.49              |
| 79:AA:817:G:O2'    | 79:AA:818:C:H5'    | 2.13                     | 0.49              |
| 79:AA:912:U:H2'    | 79:AA:913:A:O4'    | 2.13                     | 0.49              |
| 79:AA:944:U:H2'    | 79:AA:945:G:H8     | 1.76                     | 0.49              |
| 79:AA:1164:U:O2'   | 79:AA:1165:C:H5'   | 2.11                     | 0.49              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1176:G:H2'   | 79:AA:1177:C:C6    | 2.47                     | 0.49              |
| 84:A4:335:PHE:CD2  | 84:A4:360:MET:HE2  | 2.47                     | 0.49              |
| 12:C:220:GLU:OE2   | 12:C:228:ASN:HB2   | 2.13                     | 0.49              |
| 37:d:38:LYS:HE2    | 37:d:40:ARG:HH12   | 1.77                     | 0.49              |
| 67:AR:276:VAL:HG22 | 67:AR:281:ILE:HG21 | 1.94                     | 0.49              |
| 79:AA:667:U:O2'    | 79:AA:668:U:H5'    | 2.12                     | 0.49              |
| 79:AA:983:C:H2'    | 79:AA:984:C:C6     | 2.47                     | 0.49              |
| 79:AA:1530:A:O2'   | 79:AA:1531:C:H5'   | 2.12                     | 0.49              |
| 8:7:204:LYS:HE3    | 82:a:92:LEU:HD13   | 1.95                     | 0.49              |
| 12:C:180:ARG:HH11  | 12:C:181:HIS:HB3   | 1.78                     | 0.49              |
| 28:U:128:SER:O     | 28:U:132:GLU:OE1   | 2.31                     | 0.49              |
| 79:AA:1211:G:O2'   | 79:AA:1212:U:H5'   | 2.12                     | 0.49              |
| 12:C:89:ARG:HG3    | 12:C:129:GLU:CG    | 2.40                     | 0.49              |
| 33:G:132:VAL:HG22  | 33:G:173:LYS:O     | 2.13                     | 0.49              |
| 33:G:188:LEU:HD12  | 33:G:189:GLU:N     | 2.28                     | 0.49              |
| 79:AA:733:U:O2'    | 79:AA:734:C:H5'    | 2.13                     | 0.49              |
| 79:AA:1195:U:O2'   | 79:AA:1196:A:H5'   | 2.12                     | 0.49              |
| 79:AA:1455:U:H2'   | 79:AA:1456:U:C6    | 2.48                     | 0.49              |
| 6:5:107:PHE:CZ     | 6:5:315:LEU:HD12   | 2.48                     | 0.49              |
| 12:C:191:VAL:HG22  | 12:C:253:SER:CA    | 2.42                     | 0.49              |
| 16:H:172:LEU:HG    | 16:H:174:VAL:HG13  | 1.94                     | 0.49              |
| 22:O:44:ALA:HB1    | 22:O:45:PRO:HD2    | 1.94                     | 0.49              |
| 62:AL:209:LEU:HD12 | 76:A3:189:TRP:CE2  | 2.47                     | 0.49              |
| 79:AA:693:A:H2'    | 79:AA:694:C:O4'    | 2.12                     | 0.49              |
| 79:AA:1162:A:H2'   | 79:AA:1163:C:C6    | 2.47                     | 0.49              |
| 79:AA:1309:A:H2'   | 79:AA:1310:C:H6    | 1.78                     | 0.49              |
| 37:d:266:VAL:O     | 37:d:266:VAL:HG13  | 2.11                     | 0.49              |
| 47:q:141:GLU:HA    | 47:q:144:GLU:CG    | 2.43                     | 0.49              |
| 57:AF:234:ARG:HB2  | 87:A2:53:MET:HE1   | 1.95                     | 0.49              |
| 79:AA:695:A:H2'    | 79:AA:696:U:C5'    | 2.42                     | 0.49              |
| 79:AA:941:G:H4'    | 79:AA:942:A:C5'    | 2.34                     | 0.49              |
| 79:AA:946:U:H2'    | 79:AA:947:U:C6     | 2.48                     | 0.49              |
| 79:AA:1356:A:C2'   | 79:AA:1357:A:H5'   | 2.42                     | 0.49              |
| 79:AA:1396:C:H2'   | 79:AA:1397:U:C6    | 2.48                     | 0.49              |
| 84:A4:58:VAL:HG23  | 84:A4:58:VAL:O     | 2.13                     | 0.49              |
| 5:4:103:MET:HE3    | 11:A:2228:A:C2     | 2.48                     | 0.48              |
| 12:C:89:ARG:CG     | 12:C:129:GLU:HG2   | 2.41                     | 0.48              |
| 12:C:141:ARG:NH2   | 12:C:145:GLY:HA2   | 2.28                     | 0.48              |
| 18:K:7:ALA:HB3     | 18:K:8:PRO:HD3     | 1.94                     | 0.48              |
| 37:d:137:PHE:CD2   | 37:d:212:ILE:HG21  | 2.49                     | 0.48              |
| 37:d:196:GLN:HG2   | 37:d:198:ARG:NH1   | 2.27                     | 0.48              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 54:AC:60:HIS:ND1   | 79:AA:1319:A:H5''  | 2.28                     | 0.48              |
| 61:AK:52:LEU:HD22  | 73:AZ:41:PRO:HG3   | 1.95                     | 0.48              |
| 71:AV:149:ASP:HA   | 71:AV:152:ILE:HG22 | 1.95                     | 0.48              |
| 79:AA:666:C:O2'    | 79:AA:667:U:H5'    | 2.13                     | 0.48              |
| 84:A4:397:MET:HG3  | 84:A4:431:LEU:HD11 | 1.95                     | 0.48              |
| 79:AA:733:U:H2'    | 79:AA:734:C:O4'    | 2.13                     | 0.48              |
| 79:AA:979:C:H2'    | 79:AA:980:U:C6     | 2.48                     | 0.48              |
| 33:G:146:ILE:CG2   | 33:G:158:LEU:HB2   | 2.43                     | 0.48              |
| 37:d:96:ARG:HG2    | 37:d:97:ILE:N      | 2.28                     | 0.48              |
| 49:c:242:VAL:HG12  | 49:c:253:PRO:HD2   | 1.96                     | 0.48              |
| 74:A0:175:ILE:HG22 | 74:A0:178:ARG:NH1  | 2.28                     | 0.48              |
| 79:AA:1407:U:H2'   | 79:AA:1408:A:C8    | 2.47                     | 0.48              |
| 12:C:124:THR:HA    | 12:C:127:LYS:CG    | 2.41                     | 0.48              |
| 47:q:176:GLN:HA    | 47:q:179:LEU:HG    | 1.94                     | 0.48              |
| 71:AV:240:LEU:HD21 | 71:AV:251:TRP:O    | 2.13                     | 0.48              |
| 71:AV:276:CYS:SG   | 71:AV:352:LEU:HD21 | 2.53                     | 0.48              |
| 79:AA:943:G:O2'    | 79:AA:944:U:H5'    | 2.12                     | 0.48              |
| 79:AA:968:U:H2'    | 79:AA:969:A:H8     | 1.79                     | 0.48              |
| 79:AA:1471:A:O2'   | 79:AA:1472:G:H5'   | 2.14                     | 0.48              |
| 12:C:99:PRO:HA     | 12:C:105:LEU:HD23  | 1.96                     | 0.48              |
| 31:Y:176:ILE:HG21  | 81:OX:430:TRP:CG   | 2.48                     | 0.48              |
| 33:G:139:PRO:O     | 33:G:142:LYS:HE3   | 2.13                     | 0.48              |
| 33:G:164:LEU:HD13  | 33:G:168:LEU:HD21  | 1.95                     | 0.48              |
| 34:I:116:LEU:HD21  | 34:I:154:LEU:HD22  | 1.96                     | 0.48              |
| 59:AH:162:ARG:NH1  | 84:A4:71:LEU:HD21  | 2.27                     | 0.48              |
| 79:AA:697:G:H2'    | 79:AA:698:C:C6     | 2.48                     | 0.48              |
| 79:AA:819:A:H2     | 79:AA:831:U:O2     | 1.97                     | 0.48              |
| 79:AA:1005:U:O2'   | 79:AA:1006:U:H5'   | 2.13                     | 0.48              |
| 79:AA:1154:A:C3'   | 79:AA:1155:G:H5'   | 2.43                     | 0.48              |
| 79:AA:1200:G:H2'   | 79:AA:1200:G:N3    | 2.29                     | 0.48              |
| 79:AA:1209:C:H2'   | 79:AA:1210:U:H6    | 1.78                     | 0.48              |
| 12:C:117:MET:HG2   | 12:C:122:ILE:CG2   | 2.43                     | 0.48              |
| 37:d:116:MET:O     | 37:d:120:VAL:HG23  | 2.14                     | 0.48              |
| 79:AA:659:U:H2'    | 79:AA:660:C:C6     | 2.49                     | 0.48              |
| 79:AA:1062:G:O2'   | 79:AA:1063:A:H5'   | 2.13                     | 0.48              |
| 84:A4:535:MET:HE1  | 84:A4:551:CYS:HB3  | 1.95                     | 0.48              |
| 12:C:154:SER:HB3   | 12:C:288:ASP:CG    | 2.39                     | 0.48              |
| 12:C:201:VAL:HG13  | 12:C:205:ARG:NH1   | 2.29                     | 0.48              |
| 37:d:80:CYS:SG     | 37:d:166:GLU:HB2   | 2.54                     | 0.48              |
| 47:q:155:ARG:O     | 47:q:159:GLU:HG3   | 2.13                     | 0.48              |
| 55:AD:245:VAL:HG22 | 55:AD:271:ALA:HB1  | 1.96                     | 0.48              |

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| Atom-1              | Atom-2              | Interatomic distance (Å) | Clash overlap (Å) |
|---------------------|---------------------|--------------------------|-------------------|
| 63:AM:67:ALA:C      | 63:AM:68:LEU:HD22   | 2.38                     | 0.48              |
| 63:AM:77:ILE:CD1    | 63:AM:83:LEU:HD21   | 2.44                     | 0.48              |
| 71:AV:364:LEU:HA    | 71:AV:367:CYS:SG    | 2.54                     | 0.48              |
| 78:AY:305:THR:HG22  | 84:A4:67:LYS:HZ2    | 1.78                     | 0.48              |
| 79:AA:989:U:O2'     | 79:AA:990:U:H5'     | 2.14                     | 0.48              |
| 79:AA:1013:A:OP1    | 79:AA:1093:C:H4'    | 2.13                     | 0.48              |
| 79:AA:1424:U:O2'    | 79:AA:1425:U:H5'    | 2.13                     | 0.48              |
| 79:AA:1502:A:H2'    | 79:AA:1503:G:O4'    | 2.14                     | 0.48              |
| 98:AA:1782:SPM:H121 | 98:AA:1784:SPM:H122 | 1.95                     | 0.48              |
| 86:AX:112:LEU:O     | 86:AX:115:THR:HG22  | 2.13                     | 0.48              |
| 12:C:207:LEU:CD2    | 33:G:158:LEU:HD13   | 2.40                     | 0.48              |
| 12:C:218:VAL:C      | 12:C:219:LYS:HD3    | 2.38                     | 0.48              |
| 12:C:241:GLN:HG2    | 12:C:244:LYS:NZ     | 2.28                     | 0.48              |
| 56:AE:22:LEU:O      | 56:AE:26:ILE:HD12   | 2.14                     | 0.48              |
| 84:A4:482:ILE:HD11  | 84:A4:486:TYR:CE1   | 2.49                     | 0.48              |
| 37:d:85:PHE:HZ      | 37:d:209:TYR:HB2    | 1.79                     | 0.48              |
| 37:d:197:VAL:HG13   | 37:d:212:ILE:HG12   | 1.96                     | 0.48              |
| 47:q:160:ALA:O      | 47:q:164:LEU:HB2    | 2.14                     | 0.48              |
| 47:q:164:LEU:HD13   | 47:q:168:VAL:HG11   | 1.96                     | 0.48              |
| 66:AP:94:ARG:CZ     | 79:AA:1020:C:H4'    | 2.43                     | 0.48              |
| 79:AA:811:G:H2'     | 79:AA:812:A:O4'     | 2.14                     | 0.48              |
| 79:AA:827:A:H8      | 79:AA:827:A:OP2     | 1.96                     | 0.48              |
| 79:AA:832:U:H2'     | 79:AA:833:A:C8      | 2.49                     | 0.48              |
| 79:AA:1078:A:H2'    | 79:AA:1079:G:C8     | 2.49                     | 0.48              |
| 79:AA:1191:C:O2'    | 79:AA:1192:C:H5'    | 2.14                     | 0.48              |
| 79:AA:1327:G:O2'    | 79:AA:1328:G:H5'    | 2.14                     | 0.48              |
| 12:C:168:LEU:CD2    | 12:C:283:LEU:HD21   | 2.44                     | 0.48              |
| 30:X:52:ILE:HD11    | 47:q:92:TRP:HZ3     | 1.78                     | 0.48              |
| 58:AG:356:VAL:HG23  | 58:AG:361:VAL:HG23  | 1.95                     | 0.48              |
| 59:AH:155:VAL:HG21  | 75:A1:129:PHE:HB2   | 1.95                     | 0.48              |
| 79:AA:931:C:O2'     | 79:AA:932:C:H5'     | 2.14                     | 0.48              |
| 79:AA:1388:C:H2'    | 79:AA:1389:G:C5'    | 2.44                     | 0.48              |
| 79:AA:1517:A:H3'    | 79:AA:1518:C:H6     | 1.78                     | 0.48              |
| 9:8:92:LEU:HD13     | 47:q:162:GLU:HG3    | 1.96                     | 0.47              |
| 27:T:63:ARG:O       | 37:d:230:ARG:HD3    | 2.14                     | 0.47              |
| 38:e:190:ARG:O      | 38:e:194:THR:HG23   | 2.13                     | 0.47              |
| 79:AA:911:U:H2'     | 79:AA:912:U:H6      | 1.79                     | 0.47              |
| 79:AA:920:G:O2'     | 79:AA:921:U:H5'     | 2.13                     | 0.47              |
| 79:AA:957:C:H2'     | 79:AA:958:C:C6      | 2.50                     | 0.47              |
| 79:AA:1163:C:C2'    | 79:AA:1164:U:H5'    | 2.43                     | 0.47              |
| 79:AA:1497:C:O2'    | 79:AA:1498:C:H5'    | 2.14                     | 0.47              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 54:AC:106:ASP:OD2  | 75:A1:103:LEU:HD22 | 2.13                     | 0.47              |
| 65:AO:97:ARG:NH1   | 79:AA:870:C:H3'    | 2.29                     | 0.47              |
| 79:AA:1182:C:H2'   | 79:AA:1183:U:H6    | 1.79                     | 0.47              |
| 79:AA:1402:A:H2'   | 79:AA:1403:A:C8    | 2.49                     | 0.47              |
| 79:AA:1452:U:H2'   | 79:AA:1453:A:H8    | 1.78                     | 0.47              |
| 79:AA:1488:5MC:H2' | 79:AA:1489:G:H8    | 1.79                     | 0.47              |
| 79:AA:1568:U:H4'   | 79:AA:1569:G:OP2   | 2.13                     | 0.47              |
| 33:G:135:THR:HG22  | 33:G:194:THR:O     | 2.14                     | 0.47              |
| 47:q:141:GLU:HA    | 47:q:144:GLU:HG3   | 1.96                     | 0.47              |
| 58:AG:229:LEU:HD21 | 58:AG:241:VAL:HG11 | 1.97                     | 0.47              |
| 68:AS:85:PHE:O     | 72:AW:101:ILE:HD12 | 2.15                     | 0.47              |
| 79:AA:1176:G:H2'   | 79:AA:1177:C:H6    | 1.79                     | 0.47              |
| 79:AA:1354:A:O2'   | 79:AA:1355:G:H5'   | 2.14                     | 0.47              |
| 79:AA:1455:U:H2'   | 79:AA:1456:U:H6    | 1.79                     | 0.47              |
| 86:AX:145:CYS:SG   | 86:AX:259:LEU:HD22 | 2.55                     | 0.47              |
| 86:AX:357:ILE:O    | 86:AX:361:LEU:HD23 | 2.13                     | 0.47              |
| 11:A:2778:U:P      | 11:A:2782:A:H61    | 2.37                     | 0.47              |
| 57:AF:86:PHE:CE2   | 86:AX:398:LEU:HD11 | 2.49                     | 0.47              |
| 58:AG:210:VAL:O    | 58:AG:210:VAL:HG12 | 2.14                     | 0.47              |
| 79:AA:697:G:H2'    | 79:AA:698:C:H6     | 1.79                     | 0.47              |
| 79:AA:1444:A:O2'   | 79:AA:1445:G:H5'   | 2.14                     | 0.47              |
| 79:AA:1523:A:H1'   | 79:AA:1528:A:C2    | 2.50                     | 0.47              |
| 79:AA:1595:G:O2'   | 79:AA:1596:A:H5'   | 2.14                     | 0.47              |
| 79:AA:711:U:H5'    | 79:AA:712:C:C6     | 2.49                     | 0.47              |
| 79:AA:1182:C:H2'   | 79:AA:1183:U:C6    | 2.50                     | 0.47              |
| 79:AA:1379:A:O2'   | 79:AA:1380:G:H5'   | 2.15                     | 0.47              |
| 79:AA:1590:A:H2'   | 79:AA:1591:C:H6    | 1.79                     | 0.47              |
| 27:T:69:HIS:CE1    | 27:T:121:MET:HE1   | 2.50                     | 0.47              |
| 33:G:150:LYS:HE2   | 33:G:157:ASN:HA    | 1.96                     | 0.47              |
| 47:q:191:LYS:HA    | 47:q:194:LYS:HZ3   | 1.79                     | 0.47              |
| 71:AV:68:SER:CA    | 79:AA:1523:A:H5''  | 2.45                     | 0.47              |
| 79:AA:878:G:H2'    | 79:AA:879:U:C6     | 2.50                     | 0.47              |
| 79:AA:1352:C:H2'   | 79:AA:1353:A:C1'   | 2.45                     | 0.47              |
| 79:AA:1496:U:H2'   | 79:AA:1497:C:H6    | 1.79                     | 0.47              |
| 84:A4:532:LEU:HD13 | 84:A4:579:ILE:HD11 | 1.97                     | 0.47              |
| 84:A4:572:PRO:O    | 84:A4:576:LEU:HD23 | 2.15                     | 0.47              |
| 86:AX:153:LEU:HD21 | 86:AX:247:LEU:HD13 | 1.95                     | 0.47              |
| 12:C:77:ARG:CZ     | 12:C:80:ILE:HG21   | 2.45                     | 0.47              |
| 12:C:134:THR:O     | 12:C:153:LEU:HD12  | 2.15                     | 0.47              |
| 33:G:152:TYR:OH    | 33:G:184:ILE:HG21  | 2.14                     | 0.47              |
| 33:G:159:VAL:HB    | 33:G:163:LYS:HZ3   | 1.79                     | 0.47              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 37:d:52:THR:HG22   | 37:d:55:GLU:HB2    | 1.97                     | 0.47              |
| 37:d:138:PRO:HD3   | 37:d:194:VAL:HG23  | 1.96                     | 0.47              |
| 37:d:240:LYS:HE3   | 37:d:274:GLN:OE1   | 2.13                     | 0.47              |
| 55:AD:273:ASN:O    | 55:AD:276:VAL:HG22 | 2.15                     | 0.47              |
| 72:AW:162:VAL:O    | 72:AW:162:VAL:HG12 | 2.14                     | 0.47              |
| 79:AA:945:G:N7     | 98:AA:1702:SPM:H42 | 2.29                     | 0.47              |
| 79:AA:1192:C:H2'   | 79:AA:1193:U:O4'   | 2.14                     | 0.47              |
| 79:AA:1232:A:H2    | 79:AA:1404:A:H5'   | 1.79                     | 0.47              |
| 79:AA:1232:A:C2'   | 79:AA:1233:C:H5'   | 2.45                     | 0.47              |
| 79:AA:1409:A:O2'   | 79:AA:1410:G:H5'   | 2.13                     | 0.47              |
| 79:AA:1576:G:H2'   | 79:AA:1577:U:C6    | 2.49                     | 0.47              |
| 84:A4:279:TYR:HB2  | 84:A4:297:LEU:HD21 | 1.97                     | 0.47              |
| 47:q:179:LEU:HD12  | 47:q:180:GLN:N     | 2.29                     | 0.47              |
| 55:AD:228:VAL:HB   | 79:AA:1286:A:H4'   | 1.95                     | 0.47              |
| 79:AA:874:G:H2'    | 79:AA:875:U:C6     | 2.50                     | 0.47              |
| 79:AA:1213:A:O2'   | 79:AA:1239:C:H4'   | 2.14                     | 0.47              |
| 79:AA:1514:A:O2'   | 79:AA:1515:G:H5'   | 2.14                     | 0.47              |
| 37:d:85:PHE:CD2    | 37:d:211:GLN:HB2   | 2.49                     | 0.47              |
| 79:AA:979:C:O2'    | 79:AA:980:U:H5'    | 2.15                     | 0.47              |
| 84:A4:641:ILE:O    | 84:A4:641:ILE:HG22 | 2.15                     | 0.47              |
| 12:C:269:ALA:O     | 12:C:273:LEU:HG    | 2.15                     | 0.47              |
| 26:S:135:LEU:HD12  | 26:S:144:LEU:CD2   | 2.45                     | 0.47              |
| 79:AA:732:A:O2'    | 79:AA:733:U:H5'    | 2.15                     | 0.47              |
| 79:AA:1006:U:H2'   | 79:AA:1007:G:C8    | 2.49                     | 0.47              |
| 79:AA:1562:G:H1'   | 79:AA:1583:MA6:C2  | 2.44                     | 0.47              |
| 84:A4:628:ILE:HD13 | 84:A4:650:MET:HE1  | 1.97                     | 0.47              |
| 9:8:112:GLU:OE2    | 9:8:116:LEU:HD11   | 2.15                     | 0.46              |
| 47:q:178:LEU:HD12  | 47:q:178:LEU:O     | 2.14                     | 0.46              |
| 59:AH:151:SER:O    | 59:AH:155:VAL:HG23 | 2.15                     | 0.46              |
| 76:A3:195:TYR:O    | 76:A3:196:LEU:HD22 | 2.15                     | 0.46              |
| 79:AA:1198:A:C2'   | 79:AA:1199:G:H5'   | 2.45                     | 0.46              |
| 1:0:101:ILE:HG21   | 27:T:87:LEU:HD22   | 1.96                     | 0.46              |
| 12:C:182:SER:O     | 12:C:262:PRO:HA    | 2.15                     | 0.46              |
| 33:u:74:LEU:HD11   | 33:u:78:GLU:HG2    | 1.96                     | 0.46              |
| 79:AA:854:U:H2'    | 79:AA:855:A:C8     | 2.50                     | 0.46              |
| 37:d:118:SER:O     | 37:d:122:ILE:HG13  | 2.15                     | 0.46              |
| 79:AA:871:A:H4'    | 79:AA:872:G:H5'    | 1.97                     | 0.46              |
| 79:AA:874:G:H2'    | 79:AA:875:U:H6     | 1.81                     | 0.46              |
| 79:AA:960:C:C2     | 79:AA:961:U:H1'    | 2.49                     | 0.46              |
| 79:AA:1470:A:H2'   | 79:AA:1471:A:C8    | 2.47                     | 0.46              |
| 79:AA:1577:U:H2'   | 79:AA:1578:A:H8    | 1.79                     | 0.46              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 12:C:148:LEU:O     | 12:C:149:LEU:HD12  | 2.15                     | 0.46              |
| 37:d:129:ASP:O     | 37:d:130:ALA:HB3   | 2.16                     | 0.46              |
| 38:e:261:GLY:HA2   | 38:e:269:LEU:HD13  | 1.97                     | 0.46              |
| 44:m:96:ARG:O      | 44:m:99:GLN:HG3    | 2.15                     | 0.46              |
| 47:q:170:PRO:HA    | 47:q:175:PHE:CD1   | 2.49                     | 0.46              |
| 59:AH:180:LEU:HD12 | 59:AH:184:ILE:CG2  | 2.42                     | 0.46              |
| 62:AL:165:LYS:CE   | 79:AA:947:U:H5'    | 2.44                     | 0.46              |
| 79:AA:881:A:H2'    | 79:AA:882:A:C4     | 2.51                     | 0.46              |
| 79:AA:1076:5MU:O2  | 79:AA:1076:5MU:C2' | 2.64                     | 0.46              |
| 79:AA:1138:G:O2'   | 79:AA:1139:A:H5'   | 2.16                     | 0.46              |
| 79:AA:1213:A:H2'   | 79:AA:1214:A:N9    | 2.31                     | 0.46              |
| 79:AA:1366:C:H3'   | 79:AA:1367:A:H5'   | 1.98                     | 0.46              |
| 79:AA:1576:G:H2'   | 79:AA:1577:U:O4'   | 2.15                     | 0.46              |
| 28:U:112:PRO:N     | 28:U:113:GLU:HA    | 2.29                     | 0.46              |
| 33:G:129:HIS:HB2   | 33:G:175:ASN:CA    | 2.44                     | 0.46              |
| 59:AH:122:GLN:HG3  | 79:AA:1265:C:H4'   | 1.98                     | 0.46              |
| 68:AS:51:VAL:CG1   | 87:A2:117:LEU:HD11 | 2.46                     | 0.46              |
| 79:AA:1347:G:H2'   | 79:AA:1348:G:H8    | 1.80                     | 0.46              |
| 84:A4:615:MET:HE1  | 84:A4:649:VAL:CG2  | 2.46                     | 0.46              |
| 11:A:1737:A:H61    | 11:A:1760:G:C2'    | 2.28                     | 0.46              |
| 79:AA:734:C:H3'    | 79:AA:735:A:C5'    | 2.44                     | 0.46              |
| 11:A:1737:A:H61    | 11:A:1760:G:H1'    | 1.79                     | 0.46              |
| 11:A:1994:A:H61    | 11:A:2736:C:H4'    | 1.81                     | 0.46              |
| 12:C:129:GLU:O     | 12:C:130:LYS:HD2   | 2.15                     | 0.46              |
| 12:C:151:GLU:O     | 12:C:290:ILE:HB    | 2.14                     | 0.46              |
| 46:o:79:THR:HG22   | 46:o:79:THR:O      | 2.14                     | 0.46              |
| 79:AA:803:C:O2'    | 79:AA:804:C:H5'    | 2.16                     | 0.46              |
| 79:AA:872:G:O2'    | 79:AA:873:G:H5'    | 2.16                     | 0.46              |
| 79:AA:1357:A:O2'   | 79:AA:1358:A:H5'   | 2.16                     | 0.46              |
| 79:AA:1368:U:H4'   | 79:AA:1369:U:O5'   | 2.16                     | 0.46              |
| 79:AA:1451:U:O2'   | 79:AA:1452:U:H5'   | 2.15                     | 0.46              |
| 11:A:1906:G:H2'    | 11:A:2014:A:H61    | 1.81                     | 0.46              |
| 12:C:75:VAL:HG12   | 12:C:75:VAL:O      | 2.16                     | 0.46              |
| 12:C:89:ARG:HD2    | 12:C:153:LEU:CD2   | 2.46                     | 0.46              |
| 12:C:164:ILE:O     | 12:C:167:ILE:HG12  | 2.15                     | 0.46              |
| 22:O:94:ALA:HB3    | 22:O:95:PRO:HD3    | 1.96                     | 0.46              |
| 37:d:66:VAL:O      | 37:d:66:VAL:HG12   | 2.16                     | 0.46              |
| 72:AW:114:ILE:HG21 | 72:AW:142:LEU:HD11 | 1.98                     | 0.46              |
| 79:AA:818:C:H2'    | 79:AA:819:A:C8     | 2.51                     | 0.46              |
| 79:AA:960:C:C3'    | 79:AA:961:U:H4'    | 2.46                     | 0.46              |
| 79:AA:1005:U:H4'   | 80:AI:87:HIS:ND1   | 2.31                     | 0.46              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1134:G:H2'   | 79:AA:1135:C:O4'   | 2.16                     | 0.46              |
| 25:R:64:MET:HE1    | 27:T:204:HIS:CG    | 2.51                     | 0.46              |
| 33:G:134:LEU:CA    | 33:G:195:VAL:HG13  | 2.46                     | 0.46              |
| 37:d:147:GLU:HG3   | 37:d:163:LEU:CD1   | 2.46                     | 0.46              |
| 37:d:168:CYS:HB2   | 37:d:262:HIS:O     | 2.15                     | 0.46              |
| 47:q:175:PHE:CD1   | 47:q:179:LEU:HD23  | 2.51                     | 0.46              |
| 79:AA:889:G:C2     | 79:AA:903:U:H5'    | 2.51                     | 0.46              |
| 79:AA:1147:G:O6    | 79:AA:1158:U:H5    | 1.98                     | 0.46              |
| 84:A4:463:ASP:OD1  | 84:A4:492:THR:HG22 | 2.16                     | 0.46              |
| 33:G:139:PRO:HA    | 33:G:142:LYS:HE2   | 1.97                     | 0.46              |
| 37:d:208:VAL:H     | 37:d:253:THR:CG2   | 2.27                     | 0.46              |
| 37:d:287:LEU:CD1   | 37:d:293:TYR:HA    | 2.45                     | 0.46              |
| 79:AA:808:C:C2'    | 79:AA:809:G:H5'    | 2.46                     | 0.46              |
| 79:AA:951:G:H2'    | 79:AA:952:A:H8     | 1.81                     | 0.46              |
| 79:AA:1086:C:O2'   | 79:AA:1087:A:H5'   | 2.16                     | 0.46              |
| 79:AA:1318:A:N3    | 79:AA:1318:A:H2'   | 2.30                     | 0.46              |
| 79:AA:1504:U:O2'   | 79:AA:1505:A:H5'   | 2.16                     | 0.46              |
| 17:J:48:GLN:OE1    | 33:G:196:VAL:HG21  | 2.16                     | 0.45              |
| 33:G:133:ARG:CZ    | 33:G:171:GLU:HG3   | 2.46                     | 0.45              |
| 38:e:203:LYS:HB2   | 38:e:239:LEU:HD11  | 1.98                     | 0.45              |
| 79:AA:845:A:H2'    | 79:AA:846:A:H8     | 1.81                     | 0.45              |
| 79:AA:996:A:H2'    | 79:AA:997:A:H8     | 1.80                     | 0.45              |
| 79:AA:1207:U:H5''  | 79:AA:1218:A:N6    | 2.27                     | 0.45              |
| 82:a:103:LEU:HD12  | 82:a:107:PRO:HB2   | 1.98                     | 0.45              |
| 33:u:74:LEU:HD11   | 33:u:78:GLU:CG     | 2.46                     | 0.45              |
| 57:AF:86:PHE:HE2   | 86:AX:398:LEU:HD11 | 1.80                     | 0.45              |
| 79:AA:952:A:O2'    | 79:AA:953:U:H5'    | 2.16                     | 0.45              |
| 79:AA:985:U:H2'    | 79:AA:986:G:C8     | 2.51                     | 0.45              |
| 79:AA:1000:U:H4'   | 79:AA:1002:C:O4'   | 2.17                     | 0.45              |
| 79:AA:1237:A:H3'   | 79:AA:1237:A:N3    | 2.31                     | 0.45              |
| 79:AA:1426:U:H2'   | 79:AA:1427:A:C8    | 2.52                     | 0.45              |
| 79:AA:1509:U:H2'   | 79:AA:1510:U:C6    | 2.51                     | 0.45              |
| 33:G:164:LEU:HD12  | 33:G:168:LEU:HD21  | 1.97                     | 0.45              |
| 50:f:121:VAL:HG22  | 50:f:159:ILE:HG22  | 1.97                     | 0.45              |
| 67:AR:147:ILE:HG23 | 67:AR:148:LEU:HD22 | 1.97                     | 0.45              |
| 79:AA:746:A:H2'    | 79:AA:747:A:H8     | 1.81                     | 0.45              |
| 79:AA:767:C:O2'    | 79:AA:768:A:H5'    | 2.16                     | 0.45              |
| 79:AA:884:U:O2'    | 79:AA:885:U:H5'    | 2.16                     | 0.45              |
| 79:AA:1246:U:H4'   | 79:AA:1247:G:O5'   | 2.17                     | 0.45              |
| 79:AA:1408:A:O4'   | 79:AA:1446:A:H4'   | 2.16                     | 0.45              |
| 9:8:99:ARG:HG3     | 38:e:84:TYR:HB2    | 1.98                     | 0.45              |

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| Atom-1             | Atom-2              | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|---------------------|--------------------------|-------------------|
| 9:8:136:ILE:HD13   | 50:f:173:ILE:HG13   | 1.98                     | 0.45              |
| 11:A:2099:U:H2'    | 11:A:2100:C:C6      | 2.51                     | 0.45              |
| 12:C:99:PRO:O      | 12:C:106:ALA:HB2    | 2.16                     | 0.45              |
| 33:G:134:LEU:HD13  | 33:G:195:VAL:CG2    | 2.46                     | 0.45              |
| 33:G:164:LEU:HD12  | 33:G:165:VAL:N      | 2.32                     | 0.45              |
| 47:q:148:ALA:HA    | 47:q:151:GLU:CG     | 2.47                     | 0.45              |
| 50:f:167:ALA:O     | 50:f:171:LEU:HD23   | 2.15                     | 0.45              |
| 79:AA:704:U:H1'    | 79:AA:705:C:C5      | 2.52                     | 0.45              |
| 98:AA:1782:SPM:C9  | 98:AA:1784:SPM:H91  | 2.47                     | 0.45              |
| 84:A4:68:VAL:HG12  | 84:A4:68:VAL:O      | 2.17                     | 0.45              |
| 12:C:283:LEU:O     | 12:C:289:VAL:HG11   | 2.16                     | 0.45              |
| 37:d:122:ILE:O     | 37:d:126:LYS:HG2    | 2.17                     | 0.45              |
| 47:q:180:GLN:O     | 47:q:184:LYS:HG3    | 2.15                     | 0.45              |
| 79:AA:704:U:H4'    | 79:AA:705:C:OP1     | 2.16                     | 0.45              |
| 79:AA:1400:U:O2'   | 79:AA:1401:G:H5'    | 2.16                     | 0.45              |
| 79:AA:1567:A:H3'   | 79:AA:1568:U:H5''   | 1.97                     | 0.45              |
| 9:8:121:TRP:CG     | 38:e:70:MET:HE3     | 2.52                     | 0.45              |
| 36:b:43:ALA:HB2    | 36:b:89:ILE:HD12    | 1.99                     | 0.45              |
| 79:AA:824:U:H2'    | 79:AA:825:U:C6      | 2.51                     | 0.45              |
| 79:AA:1215:U:C2'   | 79:AA:1216:C:H5'    | 2.46                     | 0.45              |
| 79:AA:1348:G:H2'   | 79:AA:1349:U:H6     | 1.82                     | 0.45              |
| 98:AA:1782:SPM:C11 | 98:AA:1784:SPM:H122 | 2.47                     | 0.45              |
| 86:AX:361:LEU:HD22 | 86:AX:366:LEU:HD12  | 1.99                     | 0.45              |
| 12:C:183:PHE:CE2   | 12:C:293:TYR:HB3    | 2.52                     | 0.45              |
| 33:G:133:ARG:HA    | 33:G:171:GLU:HA     | 1.99                     | 0.45              |
| 33:t:86:LEU:CG     | 33:u:71:ILE:HD11    | 2.47                     | 0.45              |
| 71:AV:231:LEU:HD12 | 71:AV:243:VAL:HG13  | 1.99                     | 0.45              |
| 79:AA:658:G:H2'    | 79:AA:659:U:C6      | 2.51                     | 0.45              |
| 79:AA:702:C:O2'    | 79:AA:703:A:H5'     | 2.15                     | 0.45              |
| 79:AA:1079:G:N2    | 79:AA:1562:G:H4'    | 2.31                     | 0.45              |
| 79:AA:1456:U:H2'   | 79:AA:1457:G:O4'    | 2.16                     | 0.45              |
| 83:Ax:18:A:H61     | 83:Ax:43:A:C2'      | 2.30                     | 0.45              |
| 12:C:119:LYS:HG3   | 12:C:123:GLU:CG     | 2.47                     | 0.45              |
| 37:d:226:ASP:HB3   | 37:d:232:MET:CG     | 2.47                     | 0.45              |
| 79:AA:689:U:O2'    | 79:AA:690:U:H5'     | 2.17                     | 0.45              |
| 79:AA:704:U:H1'    | 79:AA:705:C:H5      | 1.82                     | 0.45              |
| 87:A2:36:ARG:NH2   | 87:A2:92:THR:HG23   | 2.32                     | 0.45              |
| 7:6:265:ILE:HD13   | 23:P:58:LEU:HB2     | 1.99                     | 0.45              |
| 21:N:104:MET:HE2   | 21:N:182:LYS:HB3    | 1.99                     | 0.45              |
| 33:G:161:ALA:O     | 33:G:165:VAL:HG23   | 2.17                     | 0.45              |
| 37:d:226:ASP:HB3   | 37:d:232:MET:SD     | 2.57                     | 0.45              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 47:q:176:GLN:HA    | 47:q:179:LEU:CG    | 2.47                     | 0.45              |
| 55:AD:100:LYS:HG2  | 79:AA:1262:C:H4'   | 1.99                     | 0.45              |
| 71:AV:392:ARG:HH22 | 79:AA:1524:A:H2'   | 1.82                     | 0.45              |
| 79:AA:740:G:H2'    | 79:AA:741:A:C8     | 2.51                     | 0.45              |
| 79:AA:878:G:O2'    | 79:AA:879:U:H5'    | 2.17                     | 0.45              |
| 79:AA:1066:C:H2'   | 79:AA:1067:A:C8    | 2.52                     | 0.45              |
| 79:AA:1235:U:OP2   | 79:AA:1236:C:H3'   | 2.17                     | 0.45              |
| 86:AX:85:PRO:HA    | 86:AX:88:VAL:HG12  | 1.99                     | 0.45              |
| 2:1:19:ARG:HB2     | 2:1:62:ILE:HD11    | 1.99                     | 0.45              |
| 46:o:98:THR:O      | 46:o:98:THR:HG22   | 2.17                     | 0.45              |
| 76:A3:169:PHE:O    | 76:A3:173:LEU:HD23 | 2.17                     | 0.45              |
| 79:AA:719:G:O6     | 79:AA:791:G:H1'    | 2.17                     | 0.45              |
| 79:AA:1269:U:H4'   | 79:AA:1270:U:H3'   | 1.97                     | 0.45              |
| 79:AA:1373:U:H2'   | 79:AA:1374:A:C8    | 2.51                     | 0.45              |
| 12:C:218:VAL:O     | 12:C:219:LYS:HD3   | 2.17                     | 0.44              |
| 37:d:280:VAL:HG12  | 37:d:281:MET:N     | 2.31                     | 0.44              |
| 47:q:158:ALA:O     | 47:q:162:GLU:HG2   | 2.17                     | 0.44              |
| 53:AB:131:PHE:HE2  | 53:AB:192:LEU:HD13 | 1.82                     | 0.44              |
| 59:AH:181:PRO:O    | 59:AH:184:ILE:HG22 | 2.17                     | 0.44              |
| 79:AA:800:C:H2'    | 79:AA:801:A:C8     | 2.51                     | 0.44              |
| 79:AA:823:A:C2'    | 79:AA:824:U:H5'    | 2.47                     | 0.44              |
| 79:AA:1003:A:H2'   | 79:AA:1004:G:C8    | 2.50                     | 0.44              |
| 79:AA:1082:A:H2'   | 79:AA:1083:C:C6    | 2.52                     | 0.44              |
| 79:AA:1114:U:H2'   | 79:AA:1115:U:C6    | 2.52                     | 0.44              |
| 79:AA:1117:A:O2'   | 79:AA:1118:A:H5'   | 2.17                     | 0.44              |
| 79:AA:1469:G:H2'   | 79:AA:1470:A:H8    | 1.83                     | 0.44              |
| 79:AA:1570:G:H5''  | 79:AA:1571:U:O5'   | 2.17                     | 0.44              |
| 11:A:2053:U:OP2    | 46:o:79:THR:HG23   | 2.17                     | 0.44              |
| 11:A:2205:U:H4'    | 12:C:177:VAL:HG13  | 1.99                     | 0.44              |
| 12:C:110:GLU:OE2   | 12:C:111:VAL:HG23  | 2.16                     | 0.44              |
| 31:Y:170:ARG:NH1   | 31:Y:176:ILE:HD11  | 2.33                     | 0.44              |
| 37:d:186:VAL:HB    | 37:d:219:ARG:O     | 2.18                     | 0.44              |
| 38:e:78:GLU:OE1    | 44:m:43:VAL:HG12   | 2.17                     | 0.44              |
| 79:AA:777:G:H2'    | 79:AA:777:G:N3     | 2.33                     | 0.44              |
| 79:AA:780:C:O4'    | 79:AA:784:A:H1'    | 2.17                     | 0.44              |
| 79:AA:845:A:H2'    | 79:AA:846:A:C8     | 2.53                     | 0.44              |
| 79:AA:915:C:O2'    | 79:AA:916:C:H5'    | 2.16                     | 0.44              |
| 79:AA:958:C:H5''   | 79:AA:959:C:H5'    | 1.99                     | 0.44              |
| 79:AA:1503:G:O2'   | 79:AA:1504:U:H5'   | 2.17                     | 0.44              |
| 35:V:55:TYR:HB2    | 35:V:133:ILE:HD11  | 2.00                     | 0.44              |
| 37:d:93:GLY:HA3    | 37:d:96:ARG:HB3    | 1.99                     | 0.44              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1035:U:H2'   | 79:AA:1036:A:C8    | 2.52                     | 0.44              |
| 79:AA:1327:G:C2'   | 79:AA:1328:G:H5'   | 2.47                     | 0.44              |
| 79:AA:1369:U:H3'   | 79:AA:1370:U:C5'   | 2.48                     | 0.44              |
| 79:AA:1395:C:H2'   | 79:AA:1396:C:C6    | 2.53                     | 0.44              |
| 79:AA:1521:U:O2    | 79:AA:1521:U:H2'   | 2.17                     | 0.44              |
| 79:AA:1553:A:H2'   | 79:AA:1554:G:C8    | 2.52                     | 0.44              |
| 12:C:79:ARG:O      | 12:C:83:LYS:HG2    | 2.17                     | 0.44              |
| 37:d:48:PRO:C      | 37:d:49:LYS:HD2    | 2.42                     | 0.44              |
| 71:AV:112:TRP:CH2  | 71:AV:128:THR:HG21 | 2.53                     | 0.44              |
| 79:AA:1067:A:C2'   | 79:AA:1068:A:H5'   | 2.48                     | 0.44              |
| 79:AA:1231:A:H2    | 79:AA:1353:A:C2    | 2.36                     | 0.44              |
| 79:AA:1271:C:H3'   | 79:AA:1272:A:H8    | 1.81                     | 0.44              |
| 79:AA:1402:A:H2'   | 79:AA:1403:A:O4'   | 2.17                     | 0.44              |
| 79:AA:1523:A:H2'   | 79:AA:1524:A:H8    | 1.82                     | 0.44              |
| 9:8:92:LEU:CD1     | 47:q:162:GLU:HG3   | 2.48                     | 0.44              |
| 11:A:2457:A:P      | 92:A:3471:SPD:H72  | 2.58                     | 0.44              |
| 12:C:84:LEU:HB2    | 12:C:112:CYS:SG    | 2.57                     | 0.44              |
| 12:C:115:LYS:O     | 12:C:115:LYS:HG3   | 2.17                     | 0.44              |
| 33:G:131:THR:CA    | 33:G:174:ALA:HA    | 2.36                     | 0.44              |
| 33:G:141:ASP:HB3   | 33:G:191:VAL:O     | 2.17                     | 0.44              |
| 37:d:208:VAL:HG22  | 37:d:253:THR:HG23  | 2.00                     | 0.44              |
| 58:AG:379:ARG:HG2  | 58:AG:380:LYS:O    | 2.18                     | 0.44              |
| 71:AV:322:THR:HG23 | 71:AV:325:SER:H    | 1.81                     | 0.44              |
| 79:AA:765:C:O2     | 79:AA:765:C:H3'    | 2.17                     | 0.44              |
| 79:AA:985:U:H2'    | 79:AA:986:G:H8     | 1.83                     | 0.44              |
| 79:AA:995:A:H2'    | 79:AA:996:A:H8     | 1.81                     | 0.44              |
| 79:AA:1192:C:C2'   | 79:AA:1193:U:H5'   | 2.48                     | 0.44              |
| 79:AA:1369:U:H3'   | 79:AA:1370:U:H5'   | 1.99                     | 0.44              |
| 79:AA:1509:U:O2'   | 79:AA:1510:U:H5'   | 2.18                     | 0.44              |
| 50:f:110:VAL:HG23  | 50:f:157:VAL:HG21  | 1.99                     | 0.44              |
| 63:AM:43:ARG:NH1   | 79:AA:853:C:H4'    | 2.32                     | 0.44              |
| 67:AR:74:GLU:OE2   | 67:AR:78:ILE:HD13  | 2.17                     | 0.44              |
| 69:AT:30:MET:HE1   | 69:AT:55:ILE:HG21  | 2.00                     | 0.44              |
| 71:AV:162:SER:O    | 71:AV:166:GLU:OE1  | 2.36                     | 0.44              |
| 79:AA:679:C:O2'    | 79:AA:680:U:H5'    | 2.17                     | 0.44              |
| 79:AA:694:C:OP2    | 79:AA:814:A:H4'    | 2.16                     | 0.44              |
| 79:AA:815:C:H4'    | 79:AA:817:G:OP1    | 2.18                     | 0.44              |
| 6:5:113:LEU:HD11   | 6:5:315:LEU:HD11   | 1.99                     | 0.44              |
| 12:C:213:ALA:CB    | 12:C:246:LEU:HB2   | 2.48                     | 0.44              |
| 33:G:161:ALA:HA    | 33:G:164:LEU:HD21  | 2.00                     | 0.44              |
| 33:G:191:VAL:O     | 33:G:191:VAL:HG22  | 2.18                     | 0.44              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 78:AY:338:LEU:HD12 | 78:AY:341:PHE:CD1  | 2.52                     | 0.44              |
| 79:AA:667:U:H2'    | 79:AA:668:U:C6     | 2.53                     | 0.44              |
| 79:AA:1000:U:H5''  | 79:AA:1001:C:O5'   | 2.17                     | 0.44              |
| 79:AA:1207:U:H2'   | 79:AA:1208:U:H6    | 1.82                     | 0.44              |
| 79:AA:1262:C:H2'   | 79:AA:1263:G:O4'   | 2.18                     | 0.44              |
| 11:A:2134:A:H62    | 11:A:2135:A:H62    | 1.65                     | 0.44              |
| 33:G:133:ARG:HD3   | 33:G:171:GLU:CB    | 2.48                     | 0.44              |
| 33:G:161:ALA:HA    | 33:G:164:LEU:CD2   | 2.48                     | 0.44              |
| 75:A1:60:MET:HE3   | 75:A1:69:VAL:HG21  | 1.99                     | 0.44              |
| 77:Az:30:A:H2'     | 77:Az:31:A:C4      | 2.52                     | 0.44              |
| 79:AA:732:A:H2'    | 79:AA:733:U:H6     | 1.83                     | 0.44              |
| 79:AA:852:A:H2'    | 79:AA:853:C:H5'    | 1.99                     | 0.44              |
| 79:AA:1108:C:H4'   | 79:AA:1109:A:OP2   | 2.16                     | 0.44              |
| 79:AA:1158:U:H2'   | 79:AA:1159:A:O4'   | 2.18                     | 0.44              |
| 79:AA:1376:C:C4'   | 79:AA:1377:C:H5'   | 2.48                     | 0.44              |
| 98:AA:1782:SPM:C8  | 98:AA:1784:SPM:H91 | 2.48                     | 0.44              |
| 82:a:87:THR:O      | 82:a:91:VAL:HG23   | 2.17                     | 0.44              |
| 12:C:279:LEU:O     | 12:C:283:LEU:HG    | 2.18                     | 0.44              |
| 33:G:132:VAL:HA    | 33:G:197:LEU:CB    | 2.48                     | 0.44              |
| 55:AD:149:MET:HE3  | 55:AD:153:ALA:N    | 2.33                     | 0.44              |
| 79:AA:1239:C:H2'   | 79:AA:1240:A:C8    | 2.53                     | 0.44              |
| 79:AA:1374:A:O2'   | 79:AA:1375:C:H5'   | 2.18                     | 0.44              |
| 11:A:2457:A:OP2    | 92:A:3471:SPD:H72  | 2.18                     | 0.43              |
| 37:d:108:ARG:O     | 37:d:112:MET:HG2   | 2.18                     | 0.43              |
| 79:AA:728:C:H2'    | 79:AA:729:U:H6     | 1.83                     | 0.43              |
| 79:AA:980:U:H2'    | 79:AA:981:C:O4'    | 2.18                     | 0.43              |
| 84:A4:438:LEU:O    | 84:A4:441:THR:HG22 | 2.17                     | 0.43              |
| 84:A4:461:PHE:CE2  | 84:A4:465:ILE:HD11 | 2.53                     | 0.43              |
| 12:C:156:SER:HB2   | 12:C:159:LYS:HG3   | 2.00                     | 0.43              |
| 38:e:52:CYS:HA     | 38:e:173:LEU:HD21  | 2.01                     | 0.43              |
| 59:AH:122:GLN:CG   | 79:AA:1265:C:H4'   | 2.48                     | 0.43              |
| 79:AA:703:A:H2'    | 79:AA:705:C:OP1    | 2.19                     | 0.43              |
| 79:AA:746:A:H2'    | 79:AA:747:A:C8     | 2.53                     | 0.43              |
| 79:AA:959:C:H3'    | 79:AA:960:C:O4'    | 2.18                     | 0.43              |
| 79:AA:1173:C:O2'   | 79:AA:1174:U:H5'   | 2.17                     | 0.43              |
| 79:AA:1347:G:O2'   | 79:AA:1348:G:H5'   | 2.18                     | 0.43              |
| 79:AA:1464:G:O2'   | 79:AA:1465:C:H5'   | 2.17                     | 0.43              |
| 84:A4:375:ILE:HD11 | 84:A4:379:PHE:HE2  | 1.83                     | 0.43              |
| 12:C:250:GLY:C     | 12:C:251:LEU:HD12  | 2.43                     | 0.43              |
| 12:C:265:LYS:HG3   | 12:C:297:GLU:OE1   | 2.19                     | 0.43              |
| 33:G:132:VAL:HA    | 33:G:197:LEU:CA    | 2.48                     | 0.43              |

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| Atom-1              | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|---------------------|--------------------|--------------------------|-------------------|
| 37:d:195:VAL:HG22   | 37:d:213:THR:O     | 2.19                     | 0.43              |
| 38:e:149:LEU:HD12   | 38:e:242:ASP:CG    | 2.43                     | 0.43              |
| 52:s:137:LEU:HD21   | 52:s:422:VAL:HG11  | 2.00                     | 0.43              |
| 61:AK:127:THR:HG1   | 79:AA:1309:A:H1'   | 1.82                     | 0.43              |
| 67:AR:281:ILE:HD12  | 67:AR:285:LEU:HD21 | 2.00                     | 0.43              |
| 79:AA:702:C:H2'     | 79:AA:703:A:C8     | 2.52                     | 0.43              |
| 79:AA:795:A:H3'     | 79:AA:796:G:O4'    | 2.19                     | 0.43              |
| 79:AA:1001:C:H5''   | 79:AA:1002:C:H6    | 1.84                     | 0.43              |
| 79:AA:1262:C:C2'    | 79:AA:1263:G:H5'   | 2.48                     | 0.43              |
| 79:AA:1591:C:C2     | 79:AA:1592:U:C5    | 3.07                     | 0.43              |
| 84:A4:494:ILE:HD12  | 84:A4:530:GLU:HG3  | 1.99                     | 0.43              |
| 12:C:187:GLY:CA     | 12:C:239:LEU:HD13  | 2.48                     | 0.43              |
| 17:J:48:GLN:CD      | 33:G:196:VAL:HG21  | 2.42                     | 0.43              |
| 37:d:137:PHE:N      | 37:d:138:PRO:HD2   | 2.34                     | 0.43              |
| 59:AH:97:LEU:O      | 59:AH:101:GLU:HG3  | 2.19                     | 0.43              |
| 71:AV:148:MET:HE2   | 71:AV:185:VAL:HG21 | 2.01                     | 0.43              |
| 79:AA:836:A:H2'     | 79:AA:837:A:H8     | 1.83                     | 0.43              |
| 79:AA:1124:A:H2'    | 79:AA:1125:A:H2'   | 1.99                     | 0.43              |
| 79:AA:1161:A:H2'    | 79:AA:1162:A:C8    | 2.53                     | 0.43              |
| 79:AA:1251:A:C2'    | 79:AA:1252:G:H5'   | 2.47                     | 0.43              |
| 79:AA:1254:C:H4'    | 79:AA:1255:U:H5''  | 2.00                     | 0.43              |
| 79:AA:1280:C:O2'    | 79:AA:1281:U:H5'   | 2.19                     | 0.43              |
| 79:AA:1324:U:H2'    | 79:AA:1325:U:C6    | 2.53                     | 0.43              |
| 98:AA:1782:SPM:H112 | 98:AA:1784:SPM:C13 | 2.48                     | 0.43              |
| 11:A:1839:C:C6      | 18:K:50:LEU:HD21   | 2.53                     | 0.43              |
| 33:G:138:LYS:HE2    | 33:G:138:LYS:HA    | 2.00                     | 0.43              |
| 61:AK:115:ALA:HB2   | 61:AK:120:LEU:HD12 | 2.01                     | 0.43              |
| 79:AA:682:A:H2'     | 79:AA:683:G:H8     | 1.82                     | 0.43              |
| 79:AA:869:C:H3'     | 79:AA:870:C:C6     | 2.54                     | 0.43              |
| 79:AA:956:C:C2'     | 79:AA:957:C:H5'    | 2.49                     | 0.43              |
| 79:AA:976:A:H2'     | 79:AA:977:A:O4'    | 2.18                     | 0.43              |
| 79:AA:1034:U:O2'    | 79:AA:1035:U:H5'   | 2.18                     | 0.43              |
| 79:AA:1057:G:H4'    | 79:AA:1578:A:H4'   | 1.99                     | 0.43              |
| 79:AA:1569:G:OP1    | 79:AA:1572:A:H4'   | 2.18                     | 0.43              |
| 84:A4:556:LYS:NZ    | 84:A4:579:ILE:HD13 | 2.33                     | 0.43              |
| 12:C:81:PHE:CD1     | 12:C:117:MET:HE1   | 2.54                     | 0.43              |
| 12:C:127:LYS:O      | 12:C:130:LYS:HG2   | 2.18                     | 0.43              |
| 12:C:163:ASP:CB     | 12:C:286:HIS:HE2   | 2.32                     | 0.43              |
| 33:G:181:ALA:HA     | 33:G:184:ILE:HG12  | 2.00                     | 0.43              |
| 71:AV:226:TYR:CZ    | 71:AV:282:VAL:HG11 | 2.53                     | 0.43              |
| 79:AA:1251:A:H2'    | 79:AA:1252:G:H5'   | 1.99                     | 0.43              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 11:A:2538:C:H2'    | 11:A:2539:A:O4'    | 2.19                     | 0.43              |
| 11:A:2803:A:H2'    | 11:A:2804:A:O4'    | 2.19                     | 0.43              |
| 12:C:271:PRO:HA    | 12:C:274:GLU:CG    | 2.48                     | 0.43              |
| 33:G:140:VAL:O     | 33:G:140:VAL:HG22  | 2.19                     | 0.43              |
| 33:G:149:ILE:HG22  | 33:G:156:ILE:HD13  | 2.00                     | 0.43              |
| 37:d:197:VAL:HG22  | 37:d:212:ILE:HG23  | 2.00                     | 0.43              |
| 54:AC:163:VAL:HG11 | 54:AC:166:TYR:CE2  | 2.54                     | 0.43              |
| 56:AE:8:LEU:HD21   | 56:AE:10:LEU:HD21  | 2.01                     | 0.43              |
| 79:AA:821:U:H2'    | 79:AA:822:G:C8     | 2.54                     | 0.43              |
| 79:AA:877:G:H2'    | 79:AA:878:G:H8     | 1.84                     | 0.43              |
| 79:AA:1363:C:C2'   | 79:AA:1364:U:H5'   | 2.48                     | 0.43              |
| 79:AA:1397:U:H2'   | 79:AA:1398:U:H6    | 1.84                     | 0.43              |
| 6:5:50:TYR:CE1     | 6:5:74:ILE:HD12    | 2.52                     | 0.43              |
| 11:A:2868:C:H2'    | 11:A:2869:A:O4'    | 2.18                     | 0.43              |
| 17:J:161:SER:HA    | 43:l:69:THR:HG21   | 2.01                     | 0.43              |
| 33:G:154:GLN:O     | 33:G:156:ILE:HG23  | 2.19                     | 0.43              |
| 33:G:176:VAL:HG21  | 33:G:180:GLU:OE1   | 2.19                     | 0.43              |
| 37:d:87:ALA:O      | 37:d:265:ILE:HD13  | 2.19                     | 0.43              |
| 37:d:118:SER:HA    | 37:d:197:VAL:O     | 2.19                     | 0.43              |
| 70:AU:189:TRP:CE3  | 70:AU:197:VAL:HG13 | 2.54                     | 0.43              |
| 79:AA:764:A:H2     | 79:AA:776:A:C2     | 2.37                     | 0.43              |
| 79:AA:915:C:H2'    | 79:AA:916:C:C6     | 2.54                     | 0.43              |
| 79:AA:1506:U:O2'   | 79:AA:1507:A:H5'   | 2.18                     | 0.43              |
| 89:k:63:CYS:SG     | 89:k:75:ILE:HG23   | 2.59                     | 0.43              |
| 11:A:2205:U:O4'    | 12:C:178:GLY:HA3   | 2.18                     | 0.43              |
| 12:C:191:VAL:HG22  | 12:C:253:SER:HB2   | 2.01                     | 0.43              |
| 12:C:191:VAL:HG23  | 12:C:232:PHE:HE2   | 1.84                     | 0.43              |
| 37:d:292:GLU:O     | 37:d:292:GLU:HG2   | 2.19                     | 0.43              |
| 79:AA:1155:G:H2'   | 79:AA:1156:C:H6    | 1.84                     | 0.43              |
| 84:A4:195:LEU:HD12 | 84:A4:247:ILE:HD12 | 2.00                     | 0.43              |
| 33:G:129:HIS:HB2   | 33:G:175:ASN:C     | 2.44                     | 0.43              |
| 33:G:134:LEU:HD12  | 33:G:135:THR:N     | 2.34                     | 0.43              |
| 37:d:169:PHE:HB3   | 37:d:170:PRO:HD3   | 2.01                     | 0.43              |
| 64:AN:88:VAL:O     | 64:AN:88:VAL:HG13  | 2.19                     | 0.43              |
| 78:AY:305:THR:OG1  | 78:AY:310:LEU:HD23 | 2.19                     | 0.43              |
| 79:AA:735:A:H2'    | 79:AA:736:C:O4'    | 2.18                     | 0.43              |
| 79:AA:739:C:H2'    | 79:AA:740:G:C8     | 2.53                     | 0.43              |
| 79:AA:1032:C:H2'   | 79:AA:1033:U:H6    | 1.84                     | 0.43              |
| 79:AA:1072:G:O2'   | 79:AA:1073:G:H5'   | 2.18                     | 0.43              |
| 79:AA:1315:G:H2'   | 79:AA:1316:U:H6    | 1.82                     | 0.43              |
| 79:AA:1392:A:C2    | 79:AA:1393:G:C8    | 3.07                     | 0.43              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1409:A:H2'   | 79:AA:1410:G:H8    | 1.84                     | 0.43              |
| 79:AA:1485:G:H2'   | 79:AA:1486:B8T:O4' | 2.19                     | 0.43              |
| 79:AA:1561:C:H2'   | 79:AA:1562:G:C8    | 2.54                     | 0.43              |
| 84:A4:465:ILE:O    | 84:A4:469:GLU:CB   | 2.67                     | 0.43              |
| 16:H:248:TYR:HD2   | 16:H:252:LEU:HD23  | 1.84                     | 0.42              |
| 24:Q:62:ILE:HD11   | 71:AV:91:TYR:OH    | 2.19                     | 0.42              |
| 37:d:46:TYR:O      | 37:d:47:GLN:HB2    | 2.19                     | 0.42              |
| 64:AN:81:LEU:O     | 64:AN:81:LEU:HD23  | 2.19                     | 0.42              |
| 74:A0:10:LEU:CD1   | 79:AA:1513:A:H5''  | 2.49                     | 0.42              |
| 79:AA:1045:G:H5''  | 79:AA:1046:A:OP1   | 2.19                     | 0.42              |
| 79:AA:1203:C:H2'   | 79:AA:1204:C:C6    | 2.54                     | 0.42              |
| 79:AA:1328:G:H2'   | 79:AA:1329:U:H6    | 1.79                     | 0.42              |
| 12:C:259:GLU:HA    | 12:C:293:TYR:OH    | 2.20                     | 0.42              |
| 14:E:80:LEU:HD12   | 14:E:323:GLY:HA3   | 2.00                     | 0.42              |
| 14:E:202:GLN:HG3   | 14:E:314:LEU:HD11  | 2.01                     | 0.42              |
| 33:G:153:ILE:O     | 33:G:156:ILE:HG12  | 2.20                     | 0.42              |
| 44:m:90:ARG:HH12   | 79:AA:1396:C:H4'   | 1.83                     | 0.42              |
| 79:AA:959:C:H2'    | 79:AA:960:C:H5'    | 2.01                     | 0.42              |
| 9:8:133:ARG:O      | 9:8:136:ILE:HG22   | 2.19                     | 0.42              |
| 11:A:3201:A:H2'    | 11:A:3202:U:O4'    | 2.20                     | 0.42              |
| 22:O:44:ALA:HB1    | 22:O:45:PRO:CD     | 2.50                     | 0.42              |
| 33:G:185:LYS:CD    | 33:G:188:LEU:HD11  | 2.34                     | 0.42              |
| 35:V:138:THR:HG22  | 35:V:142:GLU:O     | 2.19                     | 0.42              |
| 76:A3:169:PHE:CE1  | 76:A3:173:LEU:HD21 | 2.55                     | 0.42              |
| 79:AA:833:A:H2'    | 79:AA:834:G:C8     | 2.54                     | 0.42              |
| 79:AA:943:G:C2'    | 79:AA:944:U:H5'    | 2.49                     | 0.42              |
| 79:AA:1041:A:P     | 79:AA:1041:A:H8    | 2.43                     | 0.42              |
| 79:AA:1239:C:H2'   | 79:AA:1240:A:H8    | 1.83                     | 0.42              |
| 79:AA:1388:C:H2'   | 79:AA:1389:G:H5'   | 2.01                     | 0.42              |
| 79:AA:1553:A:O2'   | 79:AA:1554:G:H5'   | 2.18                     | 0.42              |
| 84:A4:429:LEU:HD21 | 84:A4:469:GLU:HG2  | 2.01                     | 0.42              |
| 12:C:143:PRO:HD3   | 12:C:279:LEU:HD23  | 2.01                     | 0.42              |
| 33:G:131:THR:HB    | 33:G:174:ALA:HB1   | 2.01                     | 0.42              |
| 37:d:70:GLU:OE1    | 37:d:70:GLU:HA     | 2.20                     | 0.42              |
| 37:d:187:GLU:HG2   | 37:d:219:ARG:HB3   | 2.00                     | 0.42              |
| 37:d:198:ARG:HG2   | 37:d:198:ARG:HH11  | 1.84                     | 0.42              |
| 79:AA:773:U:H2'    | 79:AA:774:G:C8     | 2.54                     | 0.42              |
| 79:AA:890:C:H5''   | 79:AA:891:C:C5     | 2.54                     | 0.42              |
| 79:AA:1087:A:H2'   | 79:AA:1088:C:C6    | 2.55                     | 0.42              |
| 79:AA:1465:C:H4'   | 79:AA:1466:C:H5'   | 2.01                     | 0.42              |
| 79:AA:1476:G:H2'   | 79:AA:1477:U:O4'   | 2.19                     | 0.42              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 84:A4:402:GLY:H    | 84:A4:438:LEU:HD11 | 1.84                     | 0.42              |
| 2:1:55:LEU:HD13    | 47:q:132:ILE:HD13  | 2.02                     | 0.42              |
| 11:A:3111:A:H2'    | 11:A:3112:A:H5''   | 2.01                     | 0.42              |
| 34:I:102:VAL:HG23  | 34:I:104:LEU:CD2   | 2.50                     | 0.42              |
| 37:d:219:ARG:HG2   | 37:d:239:PRO:HB3   | 2.00                     | 0.42              |
| 58:AG:85:LYS:HG3   | 58:AG:104:ILE:HD11 | 2.01                     | 0.42              |
| 79:AA:951:G:O2'    | 79:AA:952:A:H5'    | 2.19                     | 0.42              |
| 79:AA:1222:A:H4'   | 79:AA:1223:C:OP2   | 2.20                     | 0.42              |
| 79:AA:1398:U:O2'   | 79:AA:1399:A:H5'   | 2.20                     | 0.42              |
| 79:AA:1502:A:C2'   | 79:AA:1503:G:H5'   | 2.50                     | 0.42              |
| 84:A4:335:PHE:CG   | 84:A4:360:MET:HE2  | 2.55                     | 0.42              |
| 87:A2:33:VAL:HG21  | 87:A2:104:LEU:HD23 | 2.02                     | 0.42              |
| 12:C:86:LEU:CB     | 12:C:290:ILE:HD11  | 2.46                     | 0.42              |
| 35:V:199:MET:HE3   | 35:V:204:ILE:HG22  | 2.01                     | 0.42              |
| 79:AA:891:C:H2'    | 79:AA:892:A:C8     | 2.54                     | 0.42              |
| 79:AA:1304:C:C2'   | 79:AA:1305:A:H5'   | 2.49                     | 0.42              |
| 79:AA:1325:U:H5''  | 79:AA:1326:A:OP2   | 2.18                     | 0.42              |
| 12:C:192:GLU:HB3   | 12:C:227:ARG:NH2   | 2.35                     | 0.42              |
| 14:E:109:LEU:C     | 14:E:109:LEU:HD12  | 2.45                     | 0.42              |
| 33:G:153:ILE:CD1   | 33:G:173:LYS:HE3   | 2.49                     | 0.42              |
| 35:V:144:VAL:HG21  | 35:V:153:ILE:CD1   | 2.50                     | 0.42              |
| 47:q:148:ALA:C     | 47:q:151:GLU:HG3   | 2.45                     | 0.42              |
| 51:p:115:VAL:HG12  | 51:p:119:ILE:HD12  | 2.01                     | 0.42              |
| 58:AG:315:PHE:CD2  | 58:AG:369:LEU:HD21 | 2.54                     | 0.42              |
| 7:6:107:LYS:O      | 7:6:111:GLN:OE1    | 2.37                     | 0.42              |
| 9:8:143:GLN:O      | 9:8:147:LEU:HD23   | 2.20                     | 0.42              |
| 11:A:3112:A:C2     | 11:A:3169:C:O4'    | 2.73                     | 0.42              |
| 37:d:137:PHE:CE2   | 37:d:212:ILE:HD12  | 2.55                     | 0.42              |
| 37:d:167:HIS:HB3   | 37:d:262:HIS:CE1   | 2.55                     | 0.42              |
| 47:q:172:SER:HG    | 47:q:175:PHE:HB2   | 1.85                     | 0.42              |
| 58:AG:379:ARG:HD2  | 61:AK:128:TRP:CZ2  | 2.55                     | 0.42              |
| 79:AA:1047:A:C6    | 79:AA:1158:U:H4'   | 2.55                     | 0.42              |
| 79:AA:1414:C:H2'   | 79:AA:1415:G:C5'   | 2.47                     | 0.42              |
| 84:A4:492:THR:O    | 84:A4:496:LEU:HD23 | 2.19                     | 0.42              |
| 7:6:183:ASP:O      | 7:6:184:LEU:HD22   | 2.20                     | 0.42              |
| 12:C:139:GLU:OE2   | 12:C:180:ARG:HB3   | 2.20                     | 0.42              |
| 71:AV:113:ILE:HG21 | 71:AV:143:THR:HG22 | 2.02                     | 0.42              |
| 71:AV:392:ARG:NH2  | 79:AA:1524:A:H2'   | 2.35                     | 0.42              |
| 79:AA:701:G:O2'    | 79:AA:702:C:H5'    | 2.19                     | 0.42              |
| 79:AA:735:A:C2'    | 79:AA:736:C:H5'    | 2.49                     | 0.42              |
| 79:AA:1317:A:H3'   | 79:AA:1318:A:C8    | 2.42                     | 0.42              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 34:I:143:LEU:HD23  | 34:I:146:LEU:HD13  | 2.02                     | 0.42              |
| 47:q:167:GLN:HB3   | 50:f:199:LYS:HZ1   | 1.85                     | 0.42              |
| 78:AY:351:MET:HE3  | 78:AY:380:PHE:HE2  | 1.85                     | 0.42              |
| 79:AA:658:G:H2'    | 79:AA:659:U:H6     | 1.85                     | 0.42              |
| 79:AA:819:A:O2'    | 79:AA:820:G:H5'    | 2.20                     | 0.42              |
| 79:AA:890:C:H4'    | 79:AA:891:C:H5''   | 2.01                     | 0.42              |
| 79:AA:912:U:H2'    | 79:AA:913:A:C8     | 2.55                     | 0.42              |
| 79:AA:1155:G:H2'   | 79:AA:1156:C:C6    | 2.54                     | 0.42              |
| 79:AA:1161:A:H2'   | 79:AA:1162:A:H8    | 1.85                     | 0.42              |
| 98:AA:1782:SPM:H91 | 98:AA:1784:SPM:C12 | 2.45                     | 0.42              |
| 1:0:153:THR:O      | 1:0:153:THR:HG22   | 2.20                     | 0.41              |
| 11:A:2134:A:N6     | 11:A:2135:A:H62    | 2.18                     | 0.41              |
| 13:D:243:THR:HG22  | 13:D:244:VAL:N     | 2.35                     | 0.41              |
| 47:q:180:GLN:HB3   | 47:q:184:LYS:HE3   | 2.01                     | 0.41              |
| 62:AL:112:MET:SD   | 62:AL:116:VAL:HG21 | 2.60                     | 0.41              |
| 71:AV:141:ASN:OD1  | 71:AV:175:VAL:HG23 | 2.21                     | 0.41              |
| 71:AV:264:GLU:O    | 71:AV:267:ALA:HB3  | 2.20                     | 0.41              |
| 79:AA:947:U:O5'    | 79:AA:947:U:H6     | 2.03                     | 0.41              |
| 79:AA:1020:C:C5    | 79:AA:1021:U:C4    | 3.08                     | 0.41              |
| 79:AA:1121:A:H2'   | 79:AA:1121:A:N3    | 2.35                     | 0.41              |
| 79:AA:1328:G:H2'   | 79:AA:1329:U:O4'   | 2.20                     | 0.41              |
| 79:AA:1400:U:O2    | 79:AA:1444:A:H2    | 2.02                     | 0.41              |
| 79:AA:1408:A:H2'   | 79:AA:1409:A:H8    | 1.85                     | 0.41              |
| 84:A4:260:CYS:HA   | 84:A4:293:THR:HG21 | 2.02                     | 0.41              |
| 8:7:183:VAL:HG12   | 8:7:184:VAL:N      | 2.35                     | 0.41              |
| 12:C:168:LEU:HA    | 12:C:279:LEU:HD11  | 2.02                     | 0.41              |
| 12:C:225:GLU:OE2   | 12:C:227:ARG:HG2   | 2.20                     | 0.41              |
| 12:C:241:GLN:HA    | 12:C:244:LYS:HG2   | 2.01                     | 0.41              |
| 12:C:247:ASP:OD2   | 12:C:253:SER:HB3   | 2.19                     | 0.41              |
| 14:E:144:THR:HB    | 14:E:178:ILE:HG23  | 2.02                     | 0.41              |
| 33:G:164:LEU:O     | 33:G:168:LEU:HG    | 2.20                     | 0.41              |
| 37:d:207:ASN:HA    | 37:d:253:THR:OG1   | 2.20                     | 0.41              |
| 65:AO:107:ILE:HG21 | 65:AO:146:GLN:OE1  | 2.20                     | 0.41              |
| 75:A1:140:ASP:O    | 75:A1:144:GLU:OE1  | 2.38                     | 0.41              |
| 77:Az:27:C:O2      | 77:Az:27:C:H2'     | 2.19                     | 0.41              |
| 79:AA:808:C:H2'    | 79:AA:809:G:O4'    | 2.20                     | 0.41              |
| 79:AA:1337:U:H2'   | 79:AA:1338:A:H8    | 1.85                     | 0.41              |
| 84:A4:266:MET:CG   | 84:A4:271:ALA:HB3  | 2.50                     | 0.41              |
| 29:W:93:GLU:O      | 29:W:133:VAL:HG11  | 2.20                     | 0.41              |
| 33:G:156:ILE:O     | 33:G:156:ILE:HG13  | 2.20                     | 0.41              |
| 35:V:144:VAL:HG21  | 35:V:153:ILE:HD12  | 2.02                     | 0.41              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 52:s:332:LEU:HD21 | 52:s:359:ALA:HB2   | 2.01                     | 0.41              |
| 71:AV:187:PHE:CE1 | 71:AV:352:LEU:HD12 | 2.55                     | 0.41              |
| 79:AA:729:U:H1'   | 79:AA:745:A:N6     | 2.34                     | 0.41              |
| 79:AA:1170:G:C2'  | 79:AA:1171:A:H5'   | 2.50                     | 0.41              |
| 79:AA:1191:C:H2'  | 79:AA:1192:C:C6    | 2.55                     | 0.41              |
| 79:AA:1203:C:O2'  | 79:AA:1204:C:H5'   | 2.20                     | 0.41              |
| 79:AA:1333:G:O2'  | 79:AA:1334:G:H5'   | 2.20                     | 0.41              |
| 79:AA:1400:U:H2'  | 79:AA:1401:G:C8    | 2.55                     | 0.41              |
| 84:A4:260:CYS:SG  | 84:A4:293:THR:HG23 | 2.60                     | 0.41              |
| 9:8:164:ARG:HG3   | 50:f:88:TYR:CE1    | 2.55                     | 0.41              |
| 11:A:3150:U:C5    | 14:E:106:MET:HE3   | 2.55                     | 0.41              |
| 24:Q:240:ILE:HG21 | 24:Q:243:ILE:CD1   | 2.50                     | 0.41              |
| 60:AJ:61:VAL:HG22 | 60:AJ:107:ILE:HD13 | 2.02                     | 0.41              |
| 63:AM:20:ARG:HB2  | 79:AA:839:A:H5''   | 2.02                     | 0.41              |
| 79:AA:1195:U:H2'  | 79:AA:1196:A:C8    | 2.55                     | 0.41              |
| 79:AA:1271:C:H3'  | 79:AA:1272:A:C8    | 2.55                     | 0.41              |
| 79:AA:1455:U:O2'  | 79:AA:1456:U:H5'   | 2.21                     | 0.41              |
| 12:C:121:THR:HA   | 12:C:124:THR:OG1   | 2.21                     | 0.41              |
| 12:C:163:ASP:HB3  | 12:C:286:HIS:HE2   | 1.84                     | 0.41              |
| 12:C:166:HIS:HB3  | 12:C:170:LYS:HZ2   | 1.85                     | 0.41              |
| 37:d:57:MET:HA    | 37:d:57:MET:HE2    | 2.02                     | 0.41              |
| 37:d:80:CYS:CB    | 37:d:165:THR:HB    | 2.51                     | 0.41              |
| 33:u:60:TYR:N     | 33:u:61:PRO:CD     | 2.83                     | 0.41              |
| 52:s:271:LEU:N    | 52:s:272:PRO:HA    | 2.36                     | 0.41              |
| 55:AD:368:LEU:CD2 | 67:AR:107:THR:HG22 | 2.50                     | 0.41              |
| 58:AG:393:TRP:CG  | 92:AG:401:SPD:H31  | 2.55                     | 0.41              |
| 65:AO:59:LEU:HD22 | 65:AO:121:LYS:HB2  | 2.02                     | 0.41              |
| 70:AU:89:VAL:HG13 | 70:AU:90:LEU:HD22  | 2.02                     | 0.41              |
| 79:AA:735:A:H2'   | 79:AA:736:C:H5'    | 2.03                     | 0.41              |
| 79:AA:779:U:O2'   | 79:AA:780:C:H5'    | 2.20                     | 0.41              |
| 79:AA:1132:U:H2'  | 79:AA:1133:C:H6    | 1.80                     | 0.41              |
| 79:AA:1144:U:O2'  | 79:AA:1145:A:H5'   | 2.21                     | 0.41              |
| 79:AA:1358:A:O2'  | 79:AA:1359:U:H5'   | 2.21                     | 0.41              |
| 8:7:286:LEU:HD11  | 8:7:296:ARG:HB3    | 2.02                     | 0.41              |
| 11:A:2060:A:C8    | 11:A:2079:C:C4     | 3.08                     | 0.41              |
| 12:C:77:ARG:NH1   | 12:C:115:LYS:HD2   | 2.24                     | 0.41              |
| 12:C:136:LEU:HD12 | 12:C:138:TYR:CZ    | 2.56                     | 0.41              |
| 12:C:193:VAL:HG11 | 12:C:228:ASN:ND2   | 2.35                     | 0.41              |
| 20:M:226:PRO:HG3  | 51:p:45:LEU:HD23   | 2.02                     | 0.41              |
| 33:G:136:GLU:O    | 33:G:194:THR:HG22  | 2.21                     | 0.41              |
| 71:AV:82:ARG:O    | 71:AV:85:ILE:HG22  | 2.20                     | 0.41              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:682:A:O2'    | 79:AA:683:G:H5'    | 2.20                     | 0.41              |
| 79:AA:1302:C:C2'   | 79:AA:1303:G:H5'   | 2.51                     | 0.41              |
| 79:AA:1512:A:H4'   | 79:AA:1513:A:H3'   | 2.02                     | 0.41              |
| 79:AA:1524:A:H1'   | 79:AA:1527:A:N6    | 2.35                     | 0.41              |
| 98:AA:1782:SPM:H72 | 98:AA:1784:SPM:C9  | 2.49                     | 0.41              |
| 8:7:204:LYS:HE3    | 82:a:92:LEU:HD22   | 2.02                     | 0.41              |
| 11:A:2582:A:O3'    | 79:AA:1582:G:H1'   | 2.21                     | 0.41              |
| 92:A:3471:SPD:H52  | 92:A:3471:SPD:H81  | 1.66                     | 0.41              |
| 33:G:159:VAL:HB    | 33:G:163:LYS:HZ1   | 1.86                     | 0.41              |
| 33:G:185:LYS:HA    | 33:G:188:LEU:CG    | 2.50                     | 0.41              |
| 46:o:12:ILE:HG21   | 46:o:16:GLN:HA     | 2.03                     | 0.41              |
| 55:AD:280:HIS:CE1  | 68:AS:6:LEU:HD13   | 2.55                     | 0.41              |
| 57:AF:161:ILE:HD12 | 57:AF:170:VAL:HG21 | 2.03                     | 0.41              |
| 64:AN:22:MET:HE2   | 79:AA:767:C:H4'    | 2.03                     | 0.41              |
| 67:AR:281:ILE:O    | 67:AR:285:LEU:HD23 | 2.21                     | 0.41              |
| 79:AA:960:C:O5'    | 79:AA:960:C:H6     | 2.03                     | 0.41              |
| 79:AA:1037:A:H2'   | 79:AA:1038:C:C6    | 2.55                     | 0.41              |
| 79:AA:1162:A:O2'   | 79:AA:1163:C:H5'   | 2.21                     | 0.41              |
| 82:a:92:LEU:O      | 82:a:96:LEU:HD23   | 2.21                     | 0.41              |
| 89:k:10:LEU:HD11   | 89:k:42:VAL:CG1    | 2.50                     | 0.41              |
| 12:C:209:MET:HE1   | 12:C:249:LEU:HG    | 2.03                     | 0.41              |
| 17:J:46:ILE:HG23   | 17:J:47:ASN:N      | 2.36                     | 0.41              |
| 29:W:111:THR:HG23  | 29:W:112:GLU:N     | 2.36                     | 0.41              |
| 51:p:175:LEU:HA    | 51:p:178:ILE:HG22  | 2.02                     | 0.41              |
| 79:AA:802:C:H2'    | 79:AA:803:C:C6     | 2.56                     | 0.41              |
| 79:AA:808:C:H2'    | 79:AA:809:G:C5'    | 2.51                     | 0.41              |
| 79:AA:1135:C:C2'   | 79:AA:1136:C:H5'   | 2.51                     | 0.41              |
| 79:AA:1194:C:O2    | 79:AA:1459:A:H2    | 2.04                     | 0.41              |
| 79:AA:1241:C:O2'   | 79:AA:1242:C:H5'   | 2.20                     | 0.41              |
| 79:AA:1498:C:H2'   | 79:AA:1499:U:C6    | 2.54                     | 0.41              |
| 11:A:2192:A:O2'    | 17:J:135:VAL:HG11  | 2.20                     | 0.41              |
| 12:C:91:ALA:CB     | 12:C:108:ILE:HD12  | 2.45                     | 0.41              |
| 33:G:163:LYS:HA    | 33:G:166:GLU:OE2   | 2.21                     | 0.41              |
| 54:AC:148:LYS:HB3  | 84:A4:133:ALA:HB2  | 2.03                     | 0.41              |
| 92:AG:401:SPD:HN11 | 92:AG:401:SPD:H42  | 1.46                     | 0.41              |
| 62:AL:196:TYR:OH   | 79:AA:948:U:H1'    | 2.20                     | 0.41              |
| 63:AM:82:HIS:O     | 63:AM:83:LEU:HD22  | 2.21                     | 0.41              |
| 79:AA:877:G:O2'    | 79:AA:878:G:H5'    | 2.21                     | 0.41              |
| 79:AA:939:A:O2'    | 79:AA:940:A:H5'    | 2.21                     | 0.41              |
| 79:AA:960:C:H3'    | 79:AA:961:U:H4'    | 2.02                     | 0.41              |
| 79:AA:1156:C:C2    | 79:AA:1157:U:C5    | 3.09                     | 0.41              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:1203:C:H2'   | 79:AA:1204:C:H6    | 1.86                     | 0.41              |
| 79:AA:1429:C:H4'   | 79:AA:1430:A:O5'   | 2.21                     | 0.41              |
| 79:AA:1451:U:H2'   | 79:AA:1452:U:H6    | 1.86                     | 0.41              |
| 79:AA:1499:U:O2'   | 79:AA:1500:C:H5'   | 2.20                     | 0.41              |
| 79:AA:1581:G:H2'   | 79:AA:1583:MA6:OP2 | 2.21                     | 0.41              |
| 84:A4:81:ASP:OD2   | 84:A4:84:ALA:HB2   | 2.21                     | 0.41              |
| 12:C:84:LEU:HD13   | 12:C:112:CYS:SG    | 2.61                     | 0.41              |
| 12:C:185:LYS:HE2   | 12:C:260:PHE:CZ    | 2.56                     | 0.41              |
| 16:H:238:VAL:HG12  | 16:H:239:ASN:N     | 2.37                     | 0.41              |
| 17:J:140:VAL:O     | 17:J:144:ILE:HG12  | 2.21                     | 0.41              |
| 33:G:136:GLU:HB2   | 33:G:194:THR:CG2   | 2.50                     | 0.41              |
| 44:m:58:LYS:HZ2    | 44:m:64:ILE:HG23   | 1.85                     | 0.41              |
| 49:c:166:VAL:HG13  | 49:c:195:PHE:CD2   | 2.56                     | 0.41              |
| 50:f:93:ILE:HD13   | 50:f:186:VAL:HG23  | 2.02                     | 0.41              |
| 79:AA:893:G:H1'    | 79:AA:908:C:O2'    | 2.21                     | 0.41              |
| 79:AA:1095:U:O2'   | 79:AA:1096:A:H5'   | 2.20                     | 0.41              |
| 79:AA:1308:U:H2'   | 79:AA:1309:A:H8    | 1.86                     | 0.41              |
| 79:AA:1375:C:O5'   | 79:AA:1375:C:H6    | 2.03                     | 0.41              |
| 79:AA:1564:A:C2'   | 79:AA:1565:A:H5'   | 2.50                     | 0.41              |
| 98:AA:1782:SPM:H91 | 98:AA:1784:SPM:C11 | 2.51                     | 0.41              |
| 84:A4:468:MET:HG2  | 84:A4:468:MET:O    | 2.20                     | 0.41              |
| 11:A:3150:U:C2     | 11:A:3151:A:C8     | 3.09                     | 0.40              |
| 12:C:207:LEU:HD22  | 33:G:158:LEU:HD22  | 2.03                     | 0.40              |
| 12:C:266:VAL:HG22  | 12:C:268:LEU:CD1   | 2.51                     | 0.40              |
| 15:F:218:LEU:HD23  | 15:F:260:VAL:HB    | 2.03                     | 0.40              |
| 47:q:152:ARG:HA    | 47:q:155:ARG:NH2   | 2.36                     | 0.40              |
| 52:s:332:LEU:HD13  | 52:s:372:TYR:HB2   | 2.03                     | 0.40              |
| 59:AH:76:LEU:HD12  | 59:AH:148:LEU:HD22 | 2.02                     | 0.40              |
| 61:AK:57:LEU:HD23  | 61:AK:71:ALA:HB2   | 2.03                     | 0.40              |
| 64:AN:7:SER:O      | 79:AA:749:G:H1'    | 2.21                     | 0.40              |
| 78:AY:338:LEU:CD1  | 78:AY:351:MET:HB3  | 2.51                     | 0.40              |
| 79:AA:1044:U:H5''  | 79:AA:1110:A:O2'   | 2.21                     | 0.40              |
| 79:AA:1055:U:C2    | 79:AA:1056:A:C8    | 3.09                     | 0.40              |
| 79:AA:1178:G:H1'   | 79:AA:1567:A:C4    | 2.56                     | 0.40              |
| 79:AA:1462:G:H2'   | 79:AA:1463:G:H8    | 1.86                     | 0.40              |
| 11:A:2135:A:H2'    | 11:A:2135:A:N3     | 2.36                     | 0.40              |
| 12:C:187:GLY:HA2   | 12:C:258:LEU:HD23  | 2.02                     | 0.40              |
| 20:M:274:VAL:HG11  | 47:q:75:LEU:HD13   | 2.02                     | 0.40              |
| 33:G:132:VAL:HG21  | 33:G:184:ILE:HD12  | 2.02                     | 0.40              |
| 47:q:174:ARG:HD3   | 47:q:174:ARG:HA    | 1.82                     | 0.40              |
| 75:A1:194:VAL:CG1  | 75:A1:229:LEU:HD21 | 2.51                     | 0.40              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 79:AA:702:C:H1'    | 79:AA:842:C:O2'    | 2.21                     | 0.40              |
| 79:AA:1000:U:H4'   | 79:AA:1001:C:H5''  | 2.03                     | 0.40              |
| 79:AA:1544:A:H2'   | 79:AA:1545:U:H6    | 1.85                     | 0.40              |
| 79:AA:1555:A:O2'   | 79:AA:1556:C:H5'   | 2.20                     | 0.40              |
| 86:AX:249:ARG:O    | 86:AX:253:LEU:HD13 | 2.22                     | 0.40              |
| 11:A:2055:U:H2'    | 11:A:2056:G:H8     | 1.86                     | 0.40              |
| 17:J:114:LEU:HB3   | 43:l:96:LEU:HD21   | 2.03                     | 0.40              |
| 27:T:126:HIS:CD2   | 37:d:227:ARG:HE    | 2.39                     | 0.40              |
| 47:q:47:THR:O      | 47:q:47:THR:HG23   | 2.21                     | 0.40              |
| 53:AB:220:VAL:HG12 | 53:AB:221:GLY:N    | 2.35                     | 0.40              |
| 63:AM:110:LEU:O    | 63:AM:114:ARG:HG3  | 2.21                     | 0.40              |
| 6:5:105:TYR:CE1    | 6:5:262:ILE:HD12   | 2.56                     | 0.40              |
| 11:A:1936:A:H4'    | 11:A:1937:A:C8     | 2.57                     | 0.40              |
| 12:C:156:SER:OG    | 12:C:159:LYS:HD2   | 2.21                     | 0.40              |
| 47:q:192:GLU:HB3   | 47:q:196:LYS:HE3   | 2.03                     | 0.40              |
| 71:AV:137:ILE:HG23 | 71:AV:137:ILE:O    | 2.22                     | 0.40              |
| 4:3:110:VAL:CG2    | 4:3:161:MET:HE3    | 2.50                     | 0.40              |
| 11:A:1868:G:H2'    | 20:M:40:PRO:HG3    | 2.04                     | 0.40              |
| 11:A:2778:U:H2'    | 11:A:2779:C:O4'    | 2.21                     | 0.40              |
| 38:e:79:ILE:HD12   | 44:m:50:ARG:CZ     | 2.51                     | 0.40              |
| 58:AG:123:PRO:HD3  | 75:A1:87:MET:HE1   | 2.04                     | 0.40              |
| 71:AV:148:MET:HE1  | 71:AV:164:VAL:HG13 | 2.04                     | 0.40              |
| 74:A0:25:LEU:HD21  | 79:AA:1531:C:H2'   | 2.03                     | 0.40              |
| 79:AA:753:A:H2'    | 79:AA:754:A:C8     | 2.54                     | 0.40              |
| 79:AA:948:U:H2'    | 79:AA:949:U:C6     | 2.57                     | 0.40              |
| 79:AA:1001:C:H5''  | 79:AA:1002:C:C6    | 2.56                     | 0.40              |
| 79:AA:1165:C:O2'   | 79:AA:1166:A:H5'   | 2.21                     | 0.40              |
| 79:AA:1195:U:H2'   | 79:AA:1196:A:H8    | 1.85                     | 0.40              |
| 79:AA:1281:U:H2'   | 79:AA:1282:G:O4'   | 2.21                     | 0.40              |
| 79:AA:1306:A:C2    | 79:AA:1307:G:H1'   | 2.56                     | 0.40              |
| 79:AA:1441:A:H3'   | 79:AA:1442:G:C8    | 2.57                     | 0.40              |
| 79:AA:1461:A:O3'   | 79:AA:1462:G:H8    | 2.04                     | 0.40              |
| 84:A4:298:ILE:O    | 84:A4:302:VAL:HG23 | 2.21                     | 0.40              |
| 85:B:5:G:H2'       | 85:B:6:U:O4'       | 2.22                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles ⓘ

### 5.3.1 Protein backbone ⓘ

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

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

| Mol | Chain | Analysed      | Favoured   | Allowed | Outliers | Percentiles |     |
|-----|-------|---------------|------------|---------|----------|-------------|-----|
| 1   | 0     | 108/188 (57%) | 108 (100%) | 0       | 0        | 100         | 100 |
| 2   | 1     | 54/65 (83%)   | 54 (100%)  | 0       | 0        | 100         | 100 |
| 3   | 2     | 44/92 (48%)   | 40 (91%)   | 4 (9%)  | 0        | 100         | 100 |
| 4   | 3     | 93/188 (50%)  | 92 (99%)   | 1 (1%)  | 0        | 100         | 100 |
| 5   | 4     | 36/103 (35%)  | 36 (100%)  | 0       | 0        | 100         | 100 |
| 6   | 5     | 392/423 (93%) | 380 (97%)  | 12 (3%) | 0        | 100         | 100 |
| 7   | 6     | 352/380 (93%) | 338 (96%)  | 14 (4%) | 0        | 100         | 100 |
| 8   | 7     | 292/338 (86%) | 281 (96%)  | 11 (4%) | 0        | 100         | 100 |
| 9   | 8     | 155/206 (75%) | 151 (97%)  | 4 (3%)  | 0        | 100         | 100 |
| 10  | 9     | 122/137 (89%) | 118 (97%)  | 4 (3%)  | 0        | 100         | 100 |
| 12  | C     | 221/297 (74%) | 216 (98%)  | 5 (2%)  | 0        | 100         | 100 |
| 13  | D     | 236/305 (77%) | 226 (96%)  | 10 (4%) | 0        | 100         | 100 |
| 14  | E     | 303/348 (87%) | 291 (96%)  | 12 (4%) | 0        | 100         | 100 |
| 15  | F     | 250/311 (80%) | 244 (98%)  | 6 (2%)  | 0        | 100         | 100 |
| 16  | H     | 200/267 (75%) | 193 (96%)  | 7 (4%)  | 0        | 100         | 100 |
| 17  | J     | 173/192 (90%) | 171 (99%)  | 2 (1%)  | 0        | 100         | 100 |
| 18  | K     | 176/178 (99%) | 171 (97%)  | 5 (3%)  | 0        | 100         | 100 |
| 19  | L     | 113/145 (78%) | 108 (96%)  | 5 (4%)  | 0        | 100         | 100 |
| 20  | M     | 289/296 (98%) | 280 (97%)  | 9 (3%)  | 0        | 100         | 100 |
| 21  | N     | 220/251 (88%) | 216 (98%)  | 4 (2%)  | 0        | 100         | 100 |
| 22  | O     | 152/175 (87%) | 145 (95%)  | 7 (5%)  | 0        | 100         | 100 |
| 23  | P     | 142/180 (79%) | 136 (96%)  | 6 (4%)  | 0        | 100         | 100 |
| 24  | Q     | 237/292 (81%) | 234 (99%)  | 3 (1%)  | 0        | 100         | 100 |
| 25  | R     | 138/149 (93%) | 137 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 26  | S     | 159/205 (78%) | 153 (96%)  | 6 (4%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed      | Favoured  | Allowed | Outliers | Percentiles |     |
|-----|-------|---------------|-----------|---------|----------|-------------|-----|
| 27  | T     | 164/206 (80%) | 163 (99%) | 1 (1%)  | 0        | 100         | 100 |
| 28  | U     | 150/153 (98%) | 148 (99%) | 2 (1%)  | 0        | 100         | 100 |
| 29  | W     | 114/148 (77%) | 109 (96%) | 5 (4%)  | 0        | 100         | 100 |
| 30  | X     | 242/256 (94%) | 238 (98%) | 4 (2%)  | 0        | 100         | 100 |
| 31  | Y     | 179/250 (72%) | 174 (97%) | 5 (3%)  | 0        | 100         | 100 |
| 32  | Z     | 120/161 (74%) | 119 (99%) | 1 (1%)  | 0        | 100         | 100 |
| 33  | G     | 70/198 (35%)  | 68 (97%)  | 2 (3%)  | 0        | 100         | 100 |
| 33  | t     | 44/198 (22%)  | 42 (96%)  | 2 (4%)  | 0        | 100         | 100 |
| 33  | u     | 30/198 (15%)  | 30 (100%) | 0       | 0        | 100         | 100 |
| 34  | I     | 179/261 (69%) | 173 (97%) | 6 (3%)  | 0        | 100         | 100 |
| 35  | V     | 203/216 (94%) | 201 (99%) | 2 (1%)  | 0        | 100         | 100 |
| 36  | b     | 148/215 (69%) | 143 (97%) | 5 (3%)  | 0        | 100         | 100 |
| 37  | d     | 257/306 (84%) | 237 (92%) | 19 (7%) | 1 (0%)   | 30          | 55  |
| 38  | e     | 236/279 (85%) | 224 (95%) | 12 (5%) | 0        | 100         | 100 |
| 39  | g     | 132/166 (80%) | 125 (95%) | 7 (5%)  | 0        | 100         | 100 |
| 40  | h     | 108/158 (68%) | 103 (95%) | 5 (5%)  | 0        | 100         | 100 |
| 41  | i     | 95/128 (74%)  | 93 (98%)  | 2 (2%)  | 0        | 100         | 100 |
| 42  | j     | 92/123 (75%)  | 90 (98%)  | 2 (2%)  | 0        | 100         | 100 |
| 43  | l     | 80/138 (58%)  | 77 (96%)  | 3 (4%)  | 0        | 100         | 100 |
| 44  | m     | 90/128 (70%)  | 86 (96%)  | 4 (4%)  | 0        | 100         | 100 |
| 46  | o     | 92/102 (90%)  | 91 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 47  | q     | 175/222 (79%) | 174 (99%) | 1 (1%)  | 0        | 100         | 100 |
| 48  | r     | 160/196 (82%) | 158 (99%) | 2 (1%)  | 0        | 100         | 100 |
| 49  | c     | 282/332 (85%) | 279 (99%) | 3 (1%)  | 0        | 100         | 100 |
| 50  | f     | 153/212 (72%) | 147 (96%) | 6 (4%)  | 0        | 100         | 100 |
| 51  | p     | 141/206 (68%) | 136 (96%) | 5 (4%)  | 0        | 100         | 100 |
| 52  | s     | 381/439 (87%) | 371 (97%) | 10 (3%) | 0        | 100         | 100 |
| 53  | AB    | 223/296 (75%) | 216 (97%) | 7 (3%)  | 0        | 100         | 100 |
| 54  | AC    | 130/167 (78%) | 124 (95%) | 6 (5%)  | 0        | 100         | 100 |
| 55  | AD    | 341/430 (79%) | 329 (96%) | 12 (4%) | 0        | 100         | 100 |
| 56  | AE    | 120/125 (96%) | 117 (98%) | 3 (2%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed          | Favoured    | Allowed  | Outliers | Percentiles |     |
|-----|-------|-------------------|-------------|----------|----------|-------------|-----|
| 57  | AF    | 206/242 (85%)     | 203 (98%)   | 3 (2%)   | 0        | 100         | 100 |
| 58  | AG    | 323/396 (82%)     | 313 (97%)   | 10 (3%)  | 0        | 100         | 100 |
| 59  | AH    | 138/201 (69%)     | 131 (95%)   | 6 (4%)   | 1 (1%)   | 19          | 41  |
| 60  | AJ    | 106/138 (77%)     | 103 (97%)   | 3 (3%)   | 0        | 100         | 100 |
| 61  | AK    | 99/128 (77%)      | 98 (99%)    | 1 (1%)   | 0        | 100         | 100 |
| 62  | AL    | 172/257 (67%)     | 169 (98%)   | 3 (2%)   | 0        | 100         | 100 |
| 63  | AM    | 117/137 (85%)     | 111 (95%)   | 6 (5%)   | 0        | 100         | 100 |
| 64  | AN    | 108/130 (83%)     | 103 (95%)   | 5 (5%)   | 0        | 100         | 100 |
| 65  | AO    | 191/258 (74%)     | 183 (96%)   | 8 (4%)   | 0        | 100         | 100 |
| 66  | AP    | 95/142 (67%)      | 94 (99%)    | 1 (1%)   | 0        | 100         | 100 |
| 67  | AR    | 293/360 (81%)     | 282 (96%)   | 11 (4%)  | 0        | 100         | 100 |
| 68  | AS    | 133/190 (70%)     | 130 (98%)   | 3 (2%)   | 0        | 100         | 100 |
| 69  | AT    | 166/173 (96%)     | 164 (99%)   | 2 (1%)   | 0        | 100         | 100 |
| 70  | AU    | 174/205 (85%)     | 172 (99%)   | 2 (1%)   | 0        | 100         | 100 |
| 71  | AV    | 358/414 (86%)     | 344 (96%)   | 14 (4%)  | 0        | 100         | 100 |
| 72  | AW    | 98/187 (52%)      | 95 (97%)    | 3 (3%)   | 0        | 100         | 100 |
| 73  | AZ    | 98/106 (92%)      | 96 (98%)    | 2 (2%)   | 0        | 100         | 100 |
| 74  | A0    | 213/217 (98%)     | 207 (97%)   | 6 (3%)   | 0        | 100         | 100 |
| 75  | A1    | 277/323 (86%)     | 267 (96%)   | 10 (4%)  | 0        | 100         | 100 |
| 76  | A3    | 68/199 (34%)      | 67 (98%)    | 1 (2%)   | 0        | 100         | 100 |
| 78  | AY    | 117/395 (30%)     | 117 (100%)  | 0        | 0        | 100         | 100 |
| 80  | AI    | 135/194 (70%)     | 127 (94%)   | 8 (6%)   | 0        | 100         | 100 |
| 81  | OX    | 51/435 (12%)      | 47 (92%)    | 4 (8%)   | 0        | 100         | 100 |
| 82  | a     | 99/142 (70%)      | 93 (94%)    | 6 (6%)   | 0        | 100         | 100 |
| 84  | A4    | 584/689 (85%)     | 563 (96%)   | 21 (4%)  | 0        | 100         | 100 |
| 86  | AX    | 350/398 (88%)     | 332 (95%)   | 18 (5%)  | 0        | 100         | 100 |
| 87  | A2    | 116/118 (98%)     | 113 (97%)   | 3 (3%)   | 0        | 100         | 100 |
| 88  | AQ    | 85/87 (98%)       | 82 (96%)    | 3 (4%)   | 0        | 100         | 100 |
| 89  | k     | 100/112 (89%)     | 99 (99%)    | 1 (1%)   | 0        | 100         | 100 |
| All | All   | 14658/19297 (76%) | 14209 (97%) | 447 (3%) | 2 (0%)   | 100         | 100 |

All (2) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 59  | AH    | 126 | ILE  |
| 37  | d     | 47  | GLN  |

### 5.3.2 Protein sidechains ⓘ

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

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

| Mol | Chain | Analysed       | Rotameric  | Outliers | Percentiles |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 1   | 0     | 99/164 (60%)   | 99 (100%)  | 0        | 100         | 100 |
| 2   | 1     | 53/60 (88%)    | 53 (100%)  | 0        | 100         | 100 |
| 3   | 2     | 40/72 (56%)    | 40 (100%)  | 0        | 100         | 100 |
| 4   | 3     | 88/166 (53%)   | 88 (100%)  | 0        | 100         | 100 |
| 5   | 4     | 37/89 (42%)    | 37 (100%)  | 0        | 100         | 100 |
| 6   | 5     | 353/368 (96%)  | 353 (100%) | 0        | 100         | 100 |
| 7   | 6     | 313/332 (94%)  | 313 (100%) | 0        | 100         | 100 |
| 8   | 7     | 270/303 (89%)  | 270 (100%) | 0        | 100         | 100 |
| 9   | 8     | 146/190 (77%)  | 146 (100%) | 0        | 100         | 100 |
| 10  | 9     | 104/112 (93%)  | 104 (100%) | 0        | 100         | 100 |
| 12  | C     | 193/245 (79%)  | 193 (100%) | 0        | 100         | 100 |
| 13  | D     | 192/245 (78%)  | 192 (100%) | 0        | 100         | 100 |
| 14  | E     | 260/290 (90%)  | 260 (100%) | 0        | 100         | 100 |
| 15  | F     | 219/262 (84%)  | 219 (100%) | 0        | 100         | 100 |
| 16  | H     | 182/228 (80%)  | 182 (100%) | 0        | 100         | 100 |
| 17  | J     | 138/150 (92%)  | 137 (99%)  | 1 (1%)   | 81          | 89  |
| 18  | K     | 155/155 (100%) | 155 (100%) | 0        | 100         | 100 |
| 19  | L     | 98/124 (79%)   | 98 (100%)  | 0        | 100         | 100 |
| 20  | M     | 246/249 (99%)  | 246 (100%) | 0        | 100         | 100 |
| 21  | N     | 189/211 (90%)  | 189 (100%) | 0        | 100         | 100 |
| 22  | O     | 134/150 (89%)  | 134 (100%) | 0        | 100         | 100 |
| 23  | P     | 126/155 (81%)  | 126 (100%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed      | Rotameric  | Outliers | Percentiles |     |
|-----|-------|---------------|------------|----------|-------------|-----|
| 24  | Q     | 221/256 (86%) | 221 (100%) | 0        | 100         | 100 |
| 25  | R     | 118/126 (94%) | 118 (100%) | 0        | 100         | 100 |
| 26  | S     | 146/180 (81%) | 146 (100%) | 0        | 100         | 100 |
| 27  | T     | 146/176 (83%) | 146 (100%) | 0        | 100         | 100 |
| 28  | U     | 134/135 (99%) | 134 (100%) | 0        | 100         | 100 |
| 29  | W     | 94/119 (79%)  | 94 (100%)  | 0        | 100         | 100 |
| 30  | X     | 220/229 (96%) | 220 (100%) | 0        | 100         | 100 |
| 31  | Y     | 163/223 (73%) | 163 (100%) | 0        | 100         | 100 |
| 32  | Z     | 113/147 (77%) | 113 (100%) | 0        | 100         | 100 |
| 33  | G     | 60/158 (38%)  | 60 (100%)  | 0        | 100         | 100 |
| 33  | t     | 40/158 (25%)  | 40 (100%)  | 0        | 100         | 100 |
| 33  | u     | 31/158 (20%)  | 31 (100%)  | 0        | 100         | 100 |
| 34  | I     | 165/232 (71%) | 165 (100%) | 0        | 100         | 100 |
| 35  | V     | 183/191 (96%) | 183 (100%) | 0        | 100         | 100 |
| 36  | b     | 132/186 (71%) | 132 (100%) | 0        | 100         | 100 |
| 37  | d     | 237/274 (86%) | 237 (100%) | 0        | 100         | 100 |
| 38  | e     | 207/236 (88%) | 207 (100%) | 0        | 100         | 100 |
| 39  | g     | 124/148 (84%) | 124 (100%) | 0        | 100         | 100 |
| 40  | h     | 104/148 (70%) | 104 (100%) | 0        | 100         | 100 |
| 41  | i     | 86/110 (78%)  | 86 (100%)  | 0        | 100         | 100 |
| 42  | j     | 74/97 (76%)   | 74 (100%)  | 0        | 100         | 100 |
| 43  | l     | 76/116 (66%)  | 76 (100%)  | 0        | 100         | 100 |
| 44  | m     | 85/113 (75%)  | 85 (100%)  | 0        | 100         | 100 |
| 46  | o     | 80/87 (92%)   | 80 (100%)  | 0        | 100         | 100 |
| 47  | q     | 153/178 (86%) | 153 (100%) | 0        | 100         | 100 |
| 48  | r     | 147/169 (87%) | 147 (100%) | 0        | 100         | 100 |
| 49  | c     | 251/288 (87%) | 251 (100%) | 0        | 100         | 100 |
| 50  | f     | 139/188 (74%) | 139 (100%) | 0        | 100         | 100 |
| 51  | p     | 135/181 (75%) | 135 (100%) | 0        | 100         | 100 |
| 52  | s     | 339/381 (89%) | 339 (100%) | 0        | 100         | 100 |
| 53  | AB    | 198/249 (80%) | 198 (100%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed       | Rotameric  | Outliers | Percentiles |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 54  | AC    | 115/143 (80%)  | 115 (100%) | 0        | 100         | 100 |
| 55  | AD    | 286/357 (80%)  | 286 (100%) | 0        | 100         | 100 |
| 56  | AE    | 104/107 (97%)  | 104 (100%) | 0        | 100         | 100 |
| 57  | AF    | 185/209 (88%)  | 185 (100%) | 0        | 100         | 100 |
| 58  | AG    | 285/342 (83%)  | 285 (100%) | 0        | 100         | 100 |
| 59  | AH    | 130/180 (72%)  | 130 (100%) | 0        | 100         | 100 |
| 60  | AJ    | 93/118 (79%)   | 93 (100%)  | 0        | 100         | 100 |
| 61  | AK    | 91/113 (80%)   | 91 (100%)  | 0        | 100         | 100 |
| 62  | AL    | 158/226 (70%)  | 158 (100%) | 0        | 100         | 100 |
| 63  | AM    | 97/113 (86%)   | 97 (100%)  | 0        | 100         | 100 |
| 64  | AN    | 96/115 (84%)   | 96 (100%)  | 0        | 100         | 100 |
| 65  | AO    | 174/230 (76%)  | 174 (100%) | 0        | 100         | 100 |
| 66  | AP    | 88/123 (72%)   | 88 (100%)  | 0        | 100         | 100 |
| 67  | AR    | 264/318 (83%)  | 264 (100%) | 0        | 100         | 100 |
| 68  | AS    | 116/164 (71%)  | 116 (100%) | 0        | 100         | 100 |
| 69  | AT    | 153/157 (98%)  | 153 (100%) | 0        | 100         | 100 |
| 70  | AU    | 152/174 (87%)  | 152 (100%) | 0        | 100         | 100 |
| 71  | AV    | 325/364 (89%)  | 325 (100%) | 0        | 100         | 100 |
| 72  | AW    | 87/158 (55%)   | 87 (100%)  | 0        | 100         | 100 |
| 73  | AZ    | 90/95 (95%)    | 90 (100%)  | 0        | 100         | 100 |
| 74  | A0    | 188/189 (100%) | 188 (100%) | 0        | 100         | 100 |
| 75  | A1    | 257/291 (88%)  | 257 (100%) | 0        | 100         | 100 |
| 76  | A3    | 65/166 (39%)   | 65 (100%)  | 0        | 100         | 100 |
| 78  | AY    | 110/357 (31%)  | 110 (100%) | 0        | 100         | 100 |
| 80  | AI    | 105/147 (71%)  | 105 (100%) | 0        | 100         | 100 |
| 81  | OX    | 49/372 (13%)   | 49 (100%)  | 0        | 100         | 100 |
| 82  | a     | 99/133 (74%)   | 99 (100%)  | 0        | 100         | 100 |
| 84  | A4    | 526/609 (86%)  | 526 (100%) | 0        | 100         | 100 |
| 86  | AX    | 311/351 (89%)  | 311 (100%) | 0        | 100         | 100 |
| 87  | A2    | 100/100 (100%) | 100 (100%) | 0        | 100         | 100 |
| 88  | AQ    | 78/78 (100%)   | 78 (100%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed          | Rotameric    | Outliers | Percentiles |     |
|-----|-------|-------------------|--------------|----------|-------------|-----|
| 89  | k     | 83/89 (93%)       | 83 (100%)    | 0        | 100         | 100 |
| All | All   | 13096/16645 (79%) | 13095 (100%) | 1 (0%)   | 100         | 100 |

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

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 17  | J     | 52  | GLU  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (77) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | 0     | 120 | HIS  |
| 4   | 3     | 185 | ASN  |
| 6   | 5     | 150 | GLN  |
| 7   | 6     | 295 | GLN  |
| 7   | 6     | 332 | HIS  |
| 9   | 8     | 103 | GLN  |
| 9   | 8     | 158 | HIS  |
| 9   | 8     | 186 | GLN  |
| 12  | C     | 116 | HIS  |
| 12  | C     | 267 | GLN  |
| 12  | C     | 275 | GLN  |
| 14  | E     | 117 | HIS  |
| 15  | F     | 103 | GLN  |
| 17  | J     | 54  | ASN  |
| 18  | K     | 94  | GLN  |
| 19  | L     | 104 | ASN  |
| 19  | L     | 113 | ASN  |
| 21  | N     | 138 | HIS  |
| 22  | O     | 154 | GLN  |
| 25  | R     | 89  | ASN  |
| 25  | R     | 149 | HIS  |
| 26  | S     | 190 | GLN  |
| 27  | T     | 126 | HIS  |
| 31  | Y     | 88  | GLN  |
| 33  | G     | 129 | HIS  |
| 33  | G     | 170 | GLN  |
| 34  | I     | 119 | HIS  |
| 37  | d     | 193 | HIS  |
| 37  | d     | 235 | GLN  |
| 38  | e     | 67  | GLN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 38  | e     | 106 | HIS  |
| 38  | e     | 212 | HIS  |
| 39  | g     | 155 | GLN  |
| 41  | i     | 120 | HIS  |
| 44  | m     | 101 | GLN  |
| 46  | o     | 21  | HIS  |
| 46  | o     | 94  | HIS  |
| 47  | q     | 60  | GLN  |
| 49  | c     | 192 | GLN  |
| 51  | p     | 104 | HIS  |
| 52  | s     | 238 | ASN  |
| 52  | s     | 239 | ASN  |
| 52  | s     | 420 | GLN  |
| 54  | AC    | 57  | HIS  |
| 55  | AD    | 280 | HIS  |
| 55  | AD    | 341 | ASN  |
| 55  | AD    | 415 | GLN  |
| 56  | AE    | 54  | HIS  |
| 58  | AG    | 288 | HIS  |
| 58  | AG    | 366 | GLN  |
| 60  | AJ    | 105 | HIS  |
| 60  | AJ    | 134 | HIS  |
| 61  | AK    | 124 | GLN  |
| 62  | AL    | 77  | GLN  |
| 63  | AM    | 16  | HIS  |
| 63  | AM    | 28  | ASN  |
| 63  | AM    | 38  | HIS  |
| 65  | AO    | 147 | HIS  |
| 67  | AR    | 247 | HIS  |
| 67  | AR    | 326 | ASN  |
| 67  | AR    | 356 | HIS  |
| 69  | AT    | 101 | HIS  |
| 70  | AU    | 62  | HIS  |
| 70  | AU    | 188 | ASN  |
| 72  | AW    | 135 | GLN  |
| 74  | A0    | 24  | GLN  |
| 75  | A1    | 64  | GLN  |
| 78  | AY    | 295 | GLN  |
| 78  | AY    | 331 | HIS  |
| 78  | AY    | 372 | HIS  |
| 80  | AI    | 146 | HIS  |
| 81  | OX    | 399 | GLN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 82  | a     | 126 | HIS  |
| 84  | A4    | 122 | ASN  |
| 84  | A4    | 656 | ASN  |
| 86  | AX    | 148 | GLN  |
| 89  | k     | 72  | HIS  |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed        | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 11  | A     | 1556/1561 (99%) | 250 (16%)         | 3 (0%)          |
| 77  | Az    | 33/34 (97%)     | 13 (39%)          | 0               |
| 79  | AA    | 953/954 (99%)   | 139 (14%)         | 1 (0%)          |
| 83  | Ax    | 70/71 (98%)     | 15 (21%)          | 0               |
| 85  | B     | 71/72 (98%)     | 18 (25%)          | 0               |
| All | All   | 2683/2692 (99%) | 435 (16%)         | 4 (0%)          |

All (435) RNA backbone outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 11  | A     | 1681 | G    |
| 11  | A     | 1689 | C    |
| 11  | A     | 1692 | A    |
| 11  | A     | 1699 | C    |
| 11  | A     | 1700 | U    |
| 11  | A     | 1704 | U    |
| 11  | A     | 1708 | A    |
| 11  | A     | 1709 | G    |
| 11  | A     | 1711 | C    |
| 11  | A     | 1724 | A    |
| 11  | A     | 1727 | A    |
| 11  | A     | 1728 | U    |
| 11  | A     | 1736 | A    |
| 11  | A     | 1748 | G    |
| 11  | A     | 1765 | C    |
| 11  | A     | 1777 | A    |
| 11  | A     | 1780 | U    |
| 11  | A     | 1799 | U    |
| 11  | A     | 1805 | A    |
| 11  | A     | 1806 | U    |
| 11  | A     | 1807 | U    |
| 11  | A     | 1808 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 11  | A     | 1812 | C    |
| 11  | A     | 1813 | C    |
| 11  | A     | 1817 | C    |
| 11  | A     | 1821 | A    |
| 11  | A     | 1827 | C    |
| 11  | A     | 1828 | A    |
| 11  | A     | 1829 | A    |
| 11  | A     | 1832 | A    |
| 11  | A     | 1836 | A    |
| 11  | A     | 1844 | A    |
| 11  | A     | 1854 | U    |
| 11  | A     | 1856 | A    |
| 11  | A     | 1869 | A    |
| 11  | A     | 1871 | A    |
| 11  | A     | 1873 | A    |
| 11  | A     | 1878 | U    |
| 11  | A     | 1882 | A    |
| 11  | A     | 1886 | G    |
| 11  | A     | 1887 | A    |
| 11  | A     | 1888 | G    |
| 11  | A     | 1893 | A    |
| 11  | A     | 1901 | C    |
| 11  | A     | 1903 | C    |
| 11  | A     | 1909 | A    |
| 11  | A     | 1918 | G    |
| 11  | A     | 1937 | A    |
| 11  | A     | 1940 | A    |
| 11  | A     | 1949 | G    |
| 11  | A     | 1958 | G    |
| 11  | A     | 1975 | U    |
| 11  | A     | 1985 | G    |
| 11  | A     | 1992 | C    |
| 11  | A     | 1994 | A    |
| 11  | A     | 2001 | C    |
| 11  | A     | 2002 | G    |
| 11  | A     | 2003 | A    |
| 11  | A     | 2012 | A    |
| 11  | A     | 2015 | G    |
| 11  | A     | 2022 | G    |
| 11  | A     | 2030 | U    |
| 11  | A     | 2036 | C    |
| 11  | A     | 2037 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 11  | A     | 2039 | A    |
| 11  | A     | 2054 | U    |
| 11  | A     | 2055 | U    |
| 11  | A     | 2060 | A    |
| 11  | A     | 2071 | U    |
| 11  | A     | 2079 | C    |
| 11  | A     | 2099 | U    |
| 11  | A     | 2113 | G    |
| 11  | A     | 2125 | C    |
| 11  | A     | 2126 | U    |
| 11  | A     | 2147 | G    |
| 11  | A     | 2159 | U    |
| 11  | A     | 2160 | A    |
| 11  | A     | 2163 | A    |
| 11  | A     | 2168 | U    |
| 11  | A     | 2181 | A    |
| 11  | A     | 2185 | G    |
| 11  | A     | 2191 | A    |
| 11  | A     | 2192 | A    |
| 11  | A     | 2195 | A    |
| 11  | A     | 2196 | A    |
| 11  | A     | 2197 | G    |
| 11  | A     | 2198 | A    |
| 11  | A     | 2200 | A    |
| 11  | A     | 2214 | A    |
| 11  | A     | 2219 | C    |
| 11  | A     | 2220 | A    |
| 11  | A     | 2221 | C    |
| 11  | A     | 2223 | A    |
| 11  | A     | 2224 | C    |
| 11  | A     | 2225 | C    |
| 11  | A     | 2226 | U    |
| 11  | A     | 2230 | A    |
| 11  | A     | 2233 | U    |
| 11  | A     | 2237 | A    |
| 11  | A     | 2241 | A    |
| 11  | A     | 2243 | A    |
| 11  | A     | 2245 | A    |
| 11  | A     | 2246 | A    |
| 11  | A     | 2262 | C    |
| 11  | A     | 2263 | C    |
| 11  | A     | 2284 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 11  | A     | 2285 | U    |
| 11  | A     | 2297 | A    |
| 11  | A     | 2300 | G    |
| 11  | A     | 2322 | C    |
| 11  | A     | 2329 | C    |
| 11  | A     | 2331 | C    |
| 11  | A     | 2332 | C    |
| 11  | A     | 2333 | G    |
| 11  | A     | 2345 | G    |
| 11  | A     | 2350 | A    |
| 11  | A     | 2353 | A    |
| 11  | A     | 2357 | C    |
| 11  | A     | 2363 | A    |
| 11  | A     | 2372 | U    |
| 11  | A     | 2374 | A    |
| 11  | A     | 2390 | A    |
| 11  | A     | 2399 | A    |
| 11  | A     | 2401 | A    |
| 11  | A     | 2404 | U    |
| 11  | A     | 2407 | U    |
| 11  | A     | 2415 | C    |
| 11  | A     | 2434 | A    |
| 11  | A     | 2446 | A    |
| 11  | A     | 2451 | A    |
| 11  | A     | 2478 | G    |
| 11  | A     | 2485 | U    |
| 11  | A     | 2493 | C    |
| 11  | A     | 2502 | C    |
| 11  | A     | 2504 | A    |
| 11  | A     | 2506 | A    |
| 11  | A     | 2520 | C    |
| 11  | A     | 2521 | A    |
| 11  | A     | 2527 | A    |
| 11  | A     | 2540 | C    |
| 11  | A     | 2570 | C    |
| 11  | A     | 2571 | G    |
| 11  | A     | 2592 | G    |
| 11  | A     | 2593 | G    |
| 11  | A     | 2594 | U    |
| 11  | A     | 2599 | U    |
| 11  | A     | 2600 | A    |
| 11  | A     | 2601 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 11  | A     | 2603 | C    |
| 11  | A     | 2604 | A    |
| 11  | A     | 2618 | U    |
| 11  | A     | 2625 | C    |
| 11  | A     | 2627 | G    |
| 11  | A     | 2630 | U    |
| 11  | A     | 2633 | A    |
| 11  | A     | 2635 | G    |
| 11  | A     | 2654 | U    |
| 11  | A     | 2655 | G    |
| 11  | A     | 2656 | U    |
| 11  | A     | 2683 | C    |
| 11  | A     | 2686 | G    |
| 11  | A     | 2694 | A    |
| 11  | A     | 2696 | A    |
| 11  | A     | 2706 | A    |
| 11  | A     | 2709 | A    |
| 11  | A     | 2718 | C    |
| 11  | A     | 2719 | G    |
| 11  | A     | 2723 | A    |
| 11  | A     | 2724 | G    |
| 11  | A     | 2725 | A    |
| 11  | A     | 2732 | G    |
| 11  | A     | 2745 | A    |
| 11  | A     | 2758 | G    |
| 11  | A     | 2762 | C    |
| 11  | A     | 2763 | U    |
| 11  | A     | 2764 | A    |
| 11  | A     | 2765 | A    |
| 11  | A     | 2767 | A    |
| 11  | A     | 2768 | A    |
| 11  | A     | 2782 | A    |
| 11  | A     | 2786 | U    |
| 11  | A     | 2790 | A    |
| 11  | A     | 2810 | G    |
| 11  | A     | 2832 | A    |
| 11  | A     | 2833 | A    |
| 11  | A     | 2847 | C    |
| 11  | A     | 2864 | U    |
| 11  | A     | 2865 | C    |
| 11  | A     | 2885 | U    |
| 11  | A     | 2888 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 11  | A     | 2889 | C    |
| 11  | A     | 2893 | A    |
| 11  | A     | 2907 | U    |
| 11  | A     | 2913 | A    |
| 11  | A     | 2917 | G    |
| 11  | A     | 2918 | A    |
| 11  | A     | 2919 | A    |
| 11  | A     | 2922 | A    |
| 11  | A     | 2928 | C    |
| 11  | A     | 2934 | G    |
| 11  | A     | 2935 | A    |
| 11  | A     | 2956 | A    |
| 11  | A     | 2962 | C    |
| 11  | A     | 2971 | A    |
| 11  | A     | 2985 | C    |
| 11  | A     | 2989 | G    |
| 11  | A     | 2990 | A    |
| 11  | A     | 2992 | G    |
| 11  | A     | 2993 | U    |
| 11  | A     | 3005 | A    |
| 11  | A     | 3007 | C    |
| 11  | A     | 3016 | G    |
| 11  | A     | 3022 | G    |
| 11  | A     | 3041 | U    |
| 11  | A     | 3053 | A    |
| 11  | A     | 3054 | G    |
| 11  | A     | 3060 | C    |
| 11  | A     | 3086 | U    |
| 11  | A     | 3089 | A    |
| 11  | A     | 3090 | G    |
| 11  | A     | 3096 | U    |
| 11  | A     | 3100 | U    |
| 11  | A     | 3102 | U    |
| 11  | A     | 3108 | U    |
| 11  | A     | 3109 | U    |
| 11  | A     | 3110 | C    |
| 11  | A     | 3111 | A    |
| 11  | A     | 3112 | A    |
| 11  | A     | 3150 | U    |
| 11  | A     | 3157 | C    |
| 11  | A     | 3158 | A    |
| 11  | A     | 3162 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 11  | A     | 3169 | C    |
| 11  | A     | 3172 | C    |
| 11  | A     | 3177 | A    |
| 11  | A     | 3180 | A    |
| 11  | A     | 3183 | U    |
| 11  | A     | 3190 | A    |
| 11  | A     | 3199 | U    |
| 11  | A     | 3200 | U    |
| 11  | A     | 3207 | A    |
| 11  | A     | 3209 | A    |
| 11  | A     | 3210 | C    |
| 11  | A     | 3212 | C    |
| 11  | A     | 3217 | A    |
| 11  | A     | 3218 | A    |
| 11  | A     | 3228 | U    |
| 11  | A     | 3229 | U    |
| 11  | A     | 3230 | G    |
| 11  | A     | 3231 | U    |
| 77  | Az    | 0    | U    |
| 77  | Az    | 4    | A    |
| 77  | Az    | 11   | U    |
| 77  | Az    | 12   | U    |
| 77  | Az    | 13   | U    |
| 77  | Az    | 18   | A    |
| 77  | Az    | 21   | A    |
| 77  | Az    | 22   | A    |
| 77  | Az    | 25   | U    |
| 77  | Az    | 26   | A    |
| 77  | Az    | 27   | C    |
| 77  | Az    | 30   | A    |
| 77  | Az    | 31   | A    |
| 79  | AA    | 651  | A    |
| 79  | AA    | 680  | U    |
| 79  | AA    | 688  | A    |
| 79  | AA    | 701  | G    |
| 79  | AA    | 704  | U    |
| 79  | AA    | 706  | C    |
| 79  | AA    | 721  | U    |
| 79  | AA    | 735  | A    |
| 79  | AA    | 737  | C    |
| 79  | AA    | 738  | A    |
| 79  | AA    | 753  | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 79  | AA    | 761  | A    |
| 79  | AA    | 766  | G    |
| 79  | AA    | 777  | G    |
| 79  | AA    | 791  | G    |
| 79  | AA    | 794  | U    |
| 79  | AA    | 796  | G    |
| 79  | AA    | 828  | C    |
| 79  | AA    | 830  | U    |
| 79  | AA    | 832  | U    |
| 79  | AA    | 835  | C    |
| 79  | AA    | 836  | A    |
| 79  | AA    | 860  | A    |
| 79  | AA    | 861  | U    |
| 79  | AA    | 868  | C    |
| 79  | AA    | 870  | C    |
| 79  | AA    | 871  | A    |
| 79  | AA    | 881  | A    |
| 79  | AA    | 889  | G    |
| 79  | AA    | 890  | C    |
| 79  | AA    | 903  | U    |
| 79  | AA    | 904  | C    |
| 79  | AA    | 907  | A    |
| 79  | AA    | 910  | A    |
| 79  | AA    | 919  | A    |
| 79  | AA    | 929  | A    |
| 79  | AA    | 938  | A    |
| 79  | AA    | 939  | A    |
| 79  | AA    | 941  | G    |
| 79  | AA    | 942  | A    |
| 79  | AA    | 954  | C    |
| 79  | AA    | 959  | C    |
| 79  | AA    | 960  | C    |
| 79  | AA    | 961  | U    |
| 79  | AA    | 962  | C    |
| 79  | AA    | 967  | A    |
| 79  | AA    | 978  | A    |
| 79  | AA    | 993  | A    |
| 79  | AA    | 1001 | C    |
| 79  | AA    | 1002 | C    |
| 79  | AA    | 1011 | C    |
| 79  | AA    | 1015 | A    |
| 79  | AA    | 1031 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 79  | AA    | 1046 | A    |
| 79  | AA    | 1048 | C    |
| 79  | AA    | 1077 | U    |
| 79  | AA    | 1081 | U    |
| 79  | AA    | 1082 | A    |
| 79  | AA    | 1096 | A    |
| 79  | AA    | 1103 | A    |
| 79  | AA    | 1105 | C    |
| 79  | AA    | 1106 | C    |
| 79  | AA    | 1107 | U    |
| 79  | AA    | 1109 | A    |
| 79  | AA    | 1116 | A    |
| 79  | AA    | 1118 | A    |
| 79  | AA    | 1120 | C    |
| 79  | AA    | 1121 | A    |
| 79  | AA    | 1126 | A    |
| 79  | AA    | 1138 | G    |
| 79  | AA    | 1151 | C    |
| 79  | AA    | 1153 | C    |
| 79  | AA    | 1155 | G    |
| 79  | AA    | 1160 | A    |
| 79  | AA    | 1167 | A    |
| 79  | AA    | 1187 | U    |
| 79  | AA    | 1188 | A    |
| 79  | AA    | 1189 | U    |
| 79  | AA    | 1190 | C    |
| 79  | AA    | 1215 | U    |
| 79  | AA    | 1220 | A    |
| 79  | AA    | 1223 | C    |
| 79  | AA    | 1225 | C    |
| 79  | AA    | 1232 | A    |
| 79  | AA    | 1235 | U    |
| 79  | AA    | 1247 | G    |
| 79  | AA    | 1248 | C    |
| 79  | AA    | 1250 | C    |
| 79  | AA    | 1251 | A    |
| 79  | AA    | 1261 | C    |
| 79  | AA    | 1271 | C    |
| 79  | AA    | 1273 | G    |
| 79  | AA    | 1284 | U    |
| 79  | AA    | 1285 | G    |
| 79  | AA    | 1290 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 79  | AA    | 1291 | U    |
| 79  | AA    | 1292 | A    |
| 79  | AA    | 1318 | A    |
| 79  | AA    | 1326 | A    |
| 79  | AA    | 1327 | G    |
| 79  | AA    | 1342 | C    |
| 79  | AA    | 1343 | A    |
| 79  | AA    | 1344 | U    |
| 79  | AA    | 1353 | A    |
| 79  | AA    | 1354 | A    |
| 79  | AA    | 1355 | G    |
| 79  | AA    | 1356 | A    |
| 79  | AA    | 1387 | A    |
| 79  | AA    | 1389 | G    |
| 79  | AA    | 1390 | A    |
| 79  | AA    | 1405 | C    |
| 79  | AA    | 1422 | G    |
| 79  | AA    | 1430 | A    |
| 79  | AA    | 1443 | U    |
| 79  | AA    | 1481 | C    |
| 79  | AA    | 1482 | A    |
| 79  | AA    | 1512 | A    |
| 79  | AA    | 1519 | A    |
| 79  | AA    | 1521 | U    |
| 79  | AA    | 1522 | U    |
| 79  | AA    | 1525 | C    |
| 79  | AA    | 1526 | U    |
| 79  | AA    | 1527 | A    |
| 79  | AA    | 1528 | A    |
| 79  | AA    | 1533 | C    |
| 79  | AA    | 1537 | C    |
| 79  | AA    | 1538 | G    |
| 79  | AA    | 1539 | C    |
| 79  | AA    | 1540 | A    |
| 79  | AA    | 1557 | A    |
| 79  | AA    | 1559 | G    |
| 79  | AA    | 1560 | U    |
| 79  | AA    | 1568 | U    |
| 79  | AA    | 1571 | U    |
| 79  | AA    | 1582 | G    |
| 79  | AA    | 1584 | MA6  |
| 79  | AA    | 1594 | G    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 79  | AA    | 1595 | G    |
| 79  | AA    | 1599 | A    |
| 83  | Ax    | 13   | U    |
| 83  | Ax    | 16   | A    |
| 83  | Ax    | 17   | U    |
| 83  | Ax    | 18   | A    |
| 83  | Ax    | 22   | U    |
| 83  | Ax    | 43   | A    |
| 83  | Ax    | 44   | U    |
| 83  | Ax    | 47   | U    |
| 83  | Ax    | 51   | U    |
| 83  | Ax    | 52   | A    |
| 83  | Ax    | 56   | C    |
| 83  | Ax    | 61   | C    |
| 83  | Ax    | 63   | G    |
| 83  | Ax    | 65   | A    |
| 83  | Ax    | 71   | A    |
| 85  | B     | 2    | A    |
| 85  | B     | 8    | U    |
| 85  | B     | 10   | 2MG  |
| 85  | B     | 16   | C    |
| 85  | B     | 19   | C    |
| 85  | B     | 21   | A    |
| 85  | B     | 45   | G    |
| 85  | B     | 46   | A    |
| 85  | B     | 48   | U    |
| 85  | B     | 49   | U    |
| 85  | B     | 54   | C    |
| 85  | B     | 55   | U    |
| 85  | B     | 56   | U    |
| 85  | B     | 58   | A    |
| 85  | B     | 59   | A    |
| 85  | B     | 64   | A    |
| 85  | B     | 69   | U    |
| 85  | B     | 72   | G    |

All (4) RNA pucker outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 11  | A     | 2112 | A    |
| 11  | A     | 2245 | A    |
| 11  | A     | 2484 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 79  | AA    | 1234 | C    |

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

13 non-standard protein/DNA/RNA residues are modelled in this entry.

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

| Mol | Type | Chain | Res  | Link     | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|----------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |          | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 11  | PSU  | A     | 3067 | 11       | 18,21,22     | 1.18 | 2 (11%)  | 21,30,33    | 0.77 | 1 (4%)   |
| 11  | OMG  | A     | 3040 | 11       | 19,26,27     | 1.04 | 3 (15%)  | 21,38,41    | 0.67 | 0        |
| 79  | 5MU  | AA    | 1076 | 79       | 19,22,23     | 0.35 | 0        | 27,32,35    | 0.41 | 0        |
| 11  | OMU  | A     | 3039 | 11,91    | 19,22,23     | 0.30 | 0        | 25,31,34    | 0.66 | 1 (4%)   |
| 79  | MA6  | AA    | 1584 | 79       | 19,26,27     | 0.98 | 2 (10%)  | 18,38,41    | 0.67 | 0        |
| 11  | OMG  | A     | 2815 | 11,83,91 | 19,26,27     | 1.06 | 3 (15%)  | 21,38,41    | 0.68 | 0        |
| 79  | 5MC  | AA    | 1488 | 79       | 19,22,23     | 0.84 | 1 (5%)   | 26,32,35    | 0.50 | 0        |
| 85  | 1MA  | B     | 9    | 85       | 17,25,26     | 0.84 | 1 (5%)   | 17,37,40    | 0.75 | 0        |
| 85  | PSU  | B     | 39   | 85       | 18,21,22     | 1.06 | 1 (5%)   | 21,30,33    | 0.66 | 0        |
| 85  | 2MG  | B     | 10   | 85       | 18,26,27     | 1.06 | 2 (11%)  | 16,38,41    | 0.79 | 0        |
| 11  | 1MA  | A     | 2617 | 11       | 17,25,26     | 0.86 | 1 (5%)   | 17,37,40    | 0.77 | 0        |
| 79  | B8T  | AA    | 1486 | 79,94    | 19,22,23     | 0.41 | 0        | 25,31,34    | 0.38 | 0        |
| 79  | MA6  | AA    | 1583 | 79       | 19,26,27     | 0.97 | 2 (10%)  | 18,38,41    | 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   |
|-----|------|-------|------|------|---------|-----------|---------|
| 11  | PSU  | A     | 3067 | 11   | -       | 0/7/25/26 | 0/2/2/2 |
| 11  | OMG  | A     | 3040 | 11   | -       | 2/5/27/28 | 0/3/3/3 |
| 79  | 5MU  | AA    | 1076 | 79   | -       | 5/7/25/26 | 0/2/2/2 |

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| Mol | Type | Chain | Res  | Link     | Chirals | Torsions  | Rings   |
|-----|------|-------|------|----------|---------|-----------|---------|
| 11  | OMU  | A     | 3039 | 11,91    | -       | 0/9/27/28 | 0/2/2/2 |
| 79  | MA6  | AA    | 1584 | 79       | -       | 1/7/29/30 | 0/3/3/3 |
| 11  | OMG  | A     | 2815 | 11,83,91 | -       | 0/5/27/28 | 0/3/3/3 |
| 79  | 5MC  | AA    | 1488 | 79       | -       | 0/7/25/26 | 0/2/2/2 |
| 85  | 1MA  | B     | 9    | 85       | -       | 0/3/25/26 | 0/3/3/3 |
| 85  | PSU  | B     | 39   | 85       | -       | 0/7/25/26 | 0/2/2/2 |
| 85  | 2MG  | B     | 10   | 85       | -       | 0/5/27/28 | 0/3/3/3 |
| 11  | 1MA  | A     | 2617 | 11       | -       | 0/3/25/26 | 0/3/3/3 |
| 79  | B8T  | AA    | 1486 | 79,94    | -       | 0/7/27/28 | 0/2/2/2 |
| 79  | MA6  | AA    | 1583 | 79       | -       | 0/7/29/30 | 0/3/3/3 |

All (18) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 11  | A     | 3067 | PSU  | C6-C5   | 3.64  | 1.39        | 1.35     |
| 85  | B     | 39   | PSU  | C6-C5   | 3.61  | 1.39        | 1.35     |
| 79  | AA    | 1488 | 5MC  | C5-C4   | -3.31 | 1.41        | 1.44     |
| 11  | A     | 2815 | OMG  | C5-C6   | -2.82 | 1.41        | 1.47     |
| 11  | A     | 3040 | OMG  | C5-C6   | -2.71 | 1.42        | 1.47     |
| 85  | B     | 10   | 2MG  | C5-C6   | -2.65 | 1.42        | 1.47     |
| 11  | A     | 3067 | PSU  | O4'-C1' | -2.64 | 1.40        | 1.43     |
| 79  | AA    | 1583 | MA6  | C6-C5   | -2.40 | 1.41        | 1.44     |
| 79  | AA    | 1584 | MA6  | C6-C5   | -2.37 | 1.41        | 1.44     |
| 11  | A     | 2815 | OMG  | C8-N7   | -2.22 | 1.31        | 1.34     |
| 85  | B     | 10   | 2MG  | C8-N7   | -2.21 | 1.31        | 1.34     |
| 11  | A     | 3040 | OMG  | C8-N7   | -2.16 | 1.31        | 1.34     |
| 11  | A     | 2617 | 1MA  | C5-C4   | -2.16 | 1.37        | 1.43     |
| 79  | AA    | 1584 | MA6  | C6-N1   | 2.07  | 1.35        | 1.32     |
| 85  | B     | 9    | 1MA  | C5-C4   | -2.05 | 1.38        | 1.43     |
| 79  | AA    | 1583 | MA6  | C6-N1   | 2.03  | 1.35        | 1.32     |
| 11  | A     | 3040 | OMG  | C5-C4   | -2.03 | 1.38        | 1.43     |
| 11  | A     | 2815 | OMG  | C5-C4   | -2.00 | 1.38        | 1.43     |

All (2) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 11  | A     | 3039 | OMU  | C2'-C1'-N1  | -2.47 | 109.56      | 114.24   |
| 11  | A     | 3067 | PSU  | O4'-C1'-C2' | 2.33  | 108.37      | 105.15   |

There are no chirality outliers.

All (8) torsion outliers are listed below:

| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 79  | AA    | 1076 | 5MU  | O4'-C4'-C5'-O5' |
| 79  | AA    | 1076 | 5MU  | C3'-C4'-C5'-O5' |
| 79  | AA    | 1584 | MA6  | C4'-C5'-O5'-P   |
| 11  | A     | 3040 | OMG  | O4'-C4'-C5'-O5' |
| 11  | A     | 3040 | OMG  | C3'-C4'-C5'-O5' |
| 79  | AA    | 1076 | 5MU  | C4'-C5'-O5'-P   |
| 79  | AA    | 1076 | 5MU  | C2'-C1'-N1-C2   |
| 79  | AA    | 1076 | 5MU  | C2'-C1'-N1-C6   |

There are no ring outliers.

5 monomers are involved in 11 short contacts:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 79  | AA    | 1076 | 5MU  | 2       | 0            |
| 79  | AA    | 1584 | MA6  | 2       | 0            |
| 79  | AA    | 1488 | 5MC  | 3       | 0            |
| 79  | AA    | 1486 | B8T  | 1       | 0            |
| 79  | AA    | 1583 | MA6  | 5       | 0            |

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 281 ligands modelled in this entry, 262 are monoatomic - leaving 19 for Mogul analysis.

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

| Mol | Type | Chain | Res  | Link  | Bond lengths |      |             | Bond angles |      |             |
|-----|------|-------|------|-------|--------------|------|-------------|-------------|------|-------------|
|     |      |       |      |       | Counts       | RMSZ | $\# Z  > 2$ | Counts      | RMSZ | $\# Z  > 2$ |
| 96  | FES  | AT    | 201  | 69,63 | 0,4,4        | -    | -           | -           |      |             |
| 92  | SPD  | A     | 3471 | -     | 9,9,9        | 0.32 | 0           | 8,8,8       | 0.92 | 0           |
| 97  | NAD  | AA    | 1701 | 94    | 42,48,48     | 2.60 | 18 (42%)    | 50,73,73    | 1.23 | 7 (14%)     |
| 92  | SPD  | A     | 3469 | -     | 9,9,9        | 0.32 | 0           | 8,8,8       | 0.83 | 0           |
| 100 | GDP  | AX    | 503  | -     | 25,30,30     | 2.85 | 11 (44%)    | 30,47,47    | 1.49 | 7 (23%)     |

| Mol | Type | Chain | Res  | Link  | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|-------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |       | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 98  | SPM  | AA    | 1702 | -     | 13,13,13     | 0.36 | 0        | 12,12,12    | 1.02 | 0        |
| 92  | SPD  | AA    | 1785 | 92    | 9,9,9        | 0.33 | 0        | 8,8,8       | 0.78 | 0        |
| 92  | SPD  | AG    | 401  | 92    | 9,9,9        | 0.32 | 0        | 8,8,8       | 0.83 | 0        |
| 99  | ATP  | AX    | 501  | 94    | 28,33,33     | 0.74 | 0        | 34,52,52    | 0.79 | 1 (2%)   |
| 92  | SPD  | A     | 3302 | -     | 9,9,9        | 0.33 | 0        | 8,8,8       | 0.92 | 0        |
| 93  | PUT  | A     | 3303 | -     | 5,5,5        | 0.19 | 0        | 4,4,4       | 0.55 | 0        |
| 92  | SPD  | A     | 3301 | 94    | 9,9,9        | 0.36 | 0        | 8,8,8       | 0.72 | 0        |
| 98  | SPM  | AA    | 1782 | 98    | 13,13,13     | 0.35 | 0        | 12,12,12    | 0.95 | 0        |
| 98  | SPM  | AA    | 1784 | 98    | 13,13,13     | 0.35 | 0        | 12,12,12    | 0.91 | 0        |
| 92  | SPD  | A     | 3470 | -     | 9,9,9        | 0.32 | 0        | 8,8,8       | 0.91 | 0        |
| 96  | FES  | AP    | 201  | 56,66 | 0,4,4        | -    | -        | -           | -    | -        |
| 92  | SPD  | AA    | 1703 | -     | 9,9,9        | 0.32 | 0        | 8,8,8       | 0.89 | 0        |
| 96  | FES  | r     | 201  | 48,34 | 0,4,4        | -    | -        | -           | -    | -        |
| 95  | VAL  | e     | 301  | -     | 4,6,7        | 0.55 | 0        | 6,7,9       | 0.86 | 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   |
|-----|------|-------|------|-------|---------|-------------|---------|
| 96  | FES  | AT    | 201  | 69,63 | -       | -           | 0/1/1/1 |
| 92  | SPD  | A     | 3471 | -     | -       | 4/7/7/7     | -       |
| 97  | NAD  | AA    | 1701 | 94    | -       | 11/26/62/62 | 0/5/5/5 |
| 92  | SPD  | A     | 3469 | -     | -       | 3/7/7/7     | -       |
| 100 | GDP  | AX    | 503  | -     | -       | 5/12/32/32  | 0/3/3/3 |
| 98  | SPM  | AA    | 1702 | -     | -       | 1/11/11/11  | -       |
| 92  | SPD  | AA    | 1785 | 92    | -       | 2/7/7/7     | -       |
| 92  | SPD  | AG    | 401  | 92    | -       | 3/7/7/7     | -       |
| 99  | ATP  | AX    | 501  | 94    | -       | 0/18/38/38  | 0/3/3/3 |
| 92  | SPD  | A     | 3302 | -     | -       | 3/7/7/7     | -       |
| 93  | PUT  | A     | 3303 | -     | -       | 0/3/3/3     | -       |
| 92  | SPD  | A     | 3301 | 94    | -       | 2/7/7/7     | -       |
| 98  | SPM  | AA    | 1782 | 98    | -       | 6/11/11/11  | -       |
| 98  | SPM  | AA    | 1784 | 98    | -       | 3/11/11/11  | -       |
| 92  | SPD  | A     | 3470 | -     | -       | 3/7/7/7     | -       |
| 96  | FES  | AP    | 201  | 56,66 | -       | -           | 0/1/1/1 |
| 92  | SPD  | AA    | 1703 | -     | -       | 1/7/7/7     | -       |
| 96  | FES  | r     | 201  | 48,34 | -       | -           | 0/1/1/1 |
| 95  | VAL  | e     | 301  | -     | -       | 1/5/6/8     | -       |

All (29) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms   | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|---------|-------|-------------|----------|
| 100 | AX    | 503  | GDP  | O6-C6   | 7.26  | 1.40        | 1.23     |
| 97  | AA    | 1701 | NAD  | C7N-N7N | 7.03  | 1.45        | 1.33     |
| 97  | AA    | 1701 | NAD  | O4D-C1D | 6.41  | 1.49        | 1.40     |
| 97  | AA    | 1701 | NAD  | PN-O3   | 5.81  | 1.65        | 1.59     |
| 100 | AX    | 503  | GDP  | PA-O3A  | 5.03  | 1.64        | 1.59     |
| 100 | AX    | 503  | GDP  | C2-N2   | 4.86  | 1.45        | 1.34     |
| 100 | AX    | 503  | GDP  | O4'-C1' | 4.69  | 1.47        | 1.40     |
| 100 | AX    | 503  | GDP  | C2-N1   | 4.41  | 1.48        | 1.37     |
| 97  | AA    | 1701 | NAD  | PA-O3   | 4.35  | 1.64        | 1.59     |
| 97  | AA    | 1701 | NAD  | C6A-N6A | 3.99  | 1.48        | 1.34     |
| 100 | AX    | 503  | GDP  | C2-N3   | 3.97  | 1.42        | 1.33     |
| 97  | AA    | 1701 | NAD  | O4B-C1B | 3.73  | 1.45        | 1.40     |
| 97  | AA    | 1701 | NAD  | C1B-N9A | -3.66 | 1.40        | 1.49     |
| 100 | AX    | 503  | GDP  | C1'-N9  | -2.97 | 1.42        | 1.50     |
| 97  | AA    | 1701 | NAD  | O7N-C7N | -2.89 | 1.18        | 1.24     |
| 97  | AA    | 1701 | NAD  | C4A-N3A | -2.87 | 1.31        | 1.35     |
| 97  | AA    | 1701 | NAD  | C4N-C3N | 2.61  | 1.43        | 1.39     |
| 97  | AA    | 1701 | NAD  | C2B-C3B | -2.49 | 1.46        | 1.53     |
| 100 | AX    | 503  | GDP  | C5-C6   | -2.46 | 1.42        | 1.47     |
| 97  | AA    | 1701 | NAD  | C6A-C5A | -2.46 | 1.34        | 1.43     |
| 100 | AX    | 503  | GDP  | PB-O2B  | -2.27 | 1.46        | 1.54     |
| 100 | AX    | 503  | GDP  | PB-O3B  | -2.25 | 1.46        | 1.54     |
| 97  | AA    | 1701 | NAD  | PN-O5D  | 2.23  | 1.68        | 1.59     |
| 100 | AX    | 503  | GDP  | C2'-C3' | -2.19 | 1.47        | 1.53     |
| 97  | AA    | 1701 | NAD  | C5A-N7A | 2.16  | 1.47        | 1.39     |
| 97  | AA    | 1701 | NAD  | C8A-N7A | 2.16  | 1.38        | 1.34     |
| 97  | AA    | 1701 | NAD  | C2N-N1N | 2.16  | 1.37        | 1.35     |
| 97  | AA    | 1701 | NAD  | C2D-C3D | -2.14 | 1.47        | 1.53     |
| 97  | AA    | 1701 | NAD  | PN-O2N  | -2.07 | 1.45        | 1.55     |

All (15) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 97  | AA    | 1701 | NAD  | C4B-O4B-C1B | -3.19 | 107.00      | 109.92   |
| 97  | AA    | 1701 | NAD  | C4D-O4D-C1D | -3.01 | 107.17      | 109.92   |
| 100 | AX    | 503  | GDP  | C2-N1-C6    | -3.00 | 119.62      | 125.11   |
| 100 | AX    | 503  | GDP  | O2B-PB-O3A  | 2.85  | 114.18      | 104.64   |
| 100 | AX    | 503  | GDP  | C5-C6-N1    | 2.80  | 119.41      | 114.07   |
| 100 | AX    | 503  | GDP  | C4'-O4'-C1' | -2.76 | 107.40      | 109.92   |
| 100 | AX    | 503  | GDP  | O3B-PB-O3A  | 2.72  | 113.77      | 104.64   |
| 97  | AA    | 1701 | NAD  | C1B-N9A-C4A | -2.46 | 122.33      | 126.64   |
| 97  | AA    | 1701 | NAD  | O2A-PA-O1A  | -2.40 | 101.29      | 112.44   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 100 | AX    | 503  | GDP  | O2A-PA-O1A  | -2.39 | 101.31      | 112.44   |
| 97  | AA    | 1701 | NAD  | O2N-PN-O1N  | -2.30 | 101.73      | 112.44   |
| 99  | AX    | 501  | ATP  | C5-C6-N6    | 2.30  | 123.82      | 120.31   |
| 97  | AA    | 1701 | NAD  | C5D-C4D-C3D | -2.17 | 107.40      | 115.21   |
| 97  | AA    | 1701 | NAD  | C3N-C7N-N7N | 2.13  | 120.37      | 117.74   |
| 100 | AX    | 503  | GDP  | C2'-C3'-C4' | 2.01  | 106.49      | 102.61   |

There are no chirality outliers.

All (48) torsion outliers are listed below:

| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 95  | e     | 301  | VAL  | O-C-CA-CB       |
| 100 | AX    | 503  | GDP  | PA-O3A-PB-O3B   |
| 100 | AX    | 503  | GDP  | C5'-O5'-PA-O1A  |
| 98  | AA    | 1782 | SPM  | C6-C7-C8-C9     |
| 98  | AA    | 1782 | SPM  | N5-C6-C7-C8     |
| 98  | AA    | 1782 | SPM  | C7-C8-C9-N10    |
| 92  | A     | 3471 | SPD  | C8-C7-N6-C5     |
| 97  | AA    | 1701 | NAD  | O4D-C4D-C5D-O5D |
| 92  | A     | 3471 | SPD  | C3-C4-C5-N6     |
| 92  | A     | 3301 | SPD  | N6-C7-C8-C9     |
| 97  | AA    | 1701 | NAD  | C3D-C4D-C5D-O5D |
| 92  | AG    | 401  | SPD  | N1-C2-C3-C4     |
| 98  | AA    | 1784 | SPM  | C7-C8-C9-N10    |
| 92  | A     | 3302 | SPD  | C4-C5-N6-C7     |
| 98  | AA    | 1784 | SPM  | C12-C11-N10-C9  |
| 98  | AA    | 1784 | SPM  | C6-C7-C8-C9     |
| 92  | A     | 3302 | SPD  | C2-C3-C4-C5     |
| 92  | A     | 3471 | SPD  | C2-C3-C4-C5     |
| 92  | AG    | 401  | SPD  | C2-C3-C4-C5     |
| 92  | AA    | 1703 | SPD  | C2-C3-C4-C5     |
| 92  | AG    | 401  | SPD  | C7-C8-C9-N10    |
| 92  | AA    | 1785 | SPD  | C7-C8-C9-N10    |
| 92  | A     | 3470 | SPD  | C4-C5-N6-C7     |
| 97  | AA    | 1701 | NAD  | C4N-C3N-C7N-O7N |
| 97  | AA    | 1701 | NAD  | C4N-C3N-C7N-N7N |
| 98  | AA    | 1782 | SPM  | C12-C11-N10-C9  |
| 97  | AA    | 1701 | NAD  | C5B-O5B-PA-O1A  |
| 97  | AA    | 1701 | NAD  | C5D-O5D-PN-O3   |
| 97  | AA    | 1701 | NAD  | C5D-O5D-PN-O1N  |
| 97  | AA    | 1701 | NAD  | C5D-O5D-PN-O2N  |
| 100 | AX    | 503  | GDP  | C5'-O5'-PA-O3A  |

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| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 100 | AX    | 503  | GDP  | C5'-O5'-PA-O2A  |
| 92  | A     | 3302 | SPD  | N1-C2-C3-C4     |
| 97  | AA    | 1701 | NAD  | C2N-C3N-C7N-N7N |
| 92  | A     | 3469 | SPD  | N6-C7-C8-C9     |
| 92  | A     | 3301 | SPD  | C4-C5-N6-C7     |
| 92  | A     | 3471 | SPD  | C7-C8-C9-N10    |
| 98  | AA    | 1782 | SPM  | C11-C12-C13-N14 |
| 97  | AA    | 1701 | NAD  | C2N-C3N-C7N-O7N |
| 92  | A     | 3469 | SPD  | C8-C7-N6-C5     |
| 92  | A     | 3470 | SPD  | C2-C3-C4-C5     |
| 98  | AA    | 1702 | SPM  | N10-C11-C12-C13 |
| 100 | AX    | 503  | GDP  | PA-O3A-PB-O2B   |
| 92  | AA    | 1785 | SPD  | C2-C3-C4-C5     |
| 98  | AA    | 1782 | SPM  | C8-C9-N10-C11   |
| 92  | A     | 3469 | SPD  | C2-C3-C4-C5     |
| 92  | A     | 3470 | SPD  | C7-C8-C9-N10    |
| 97  | AA    | 1701 | NAD  | C4B-C5B-O5B-PA  |

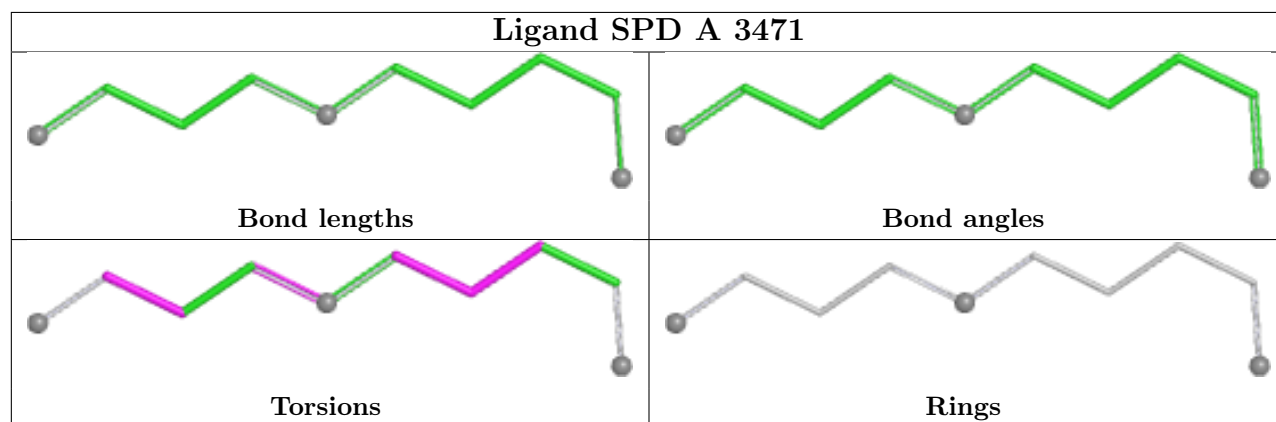
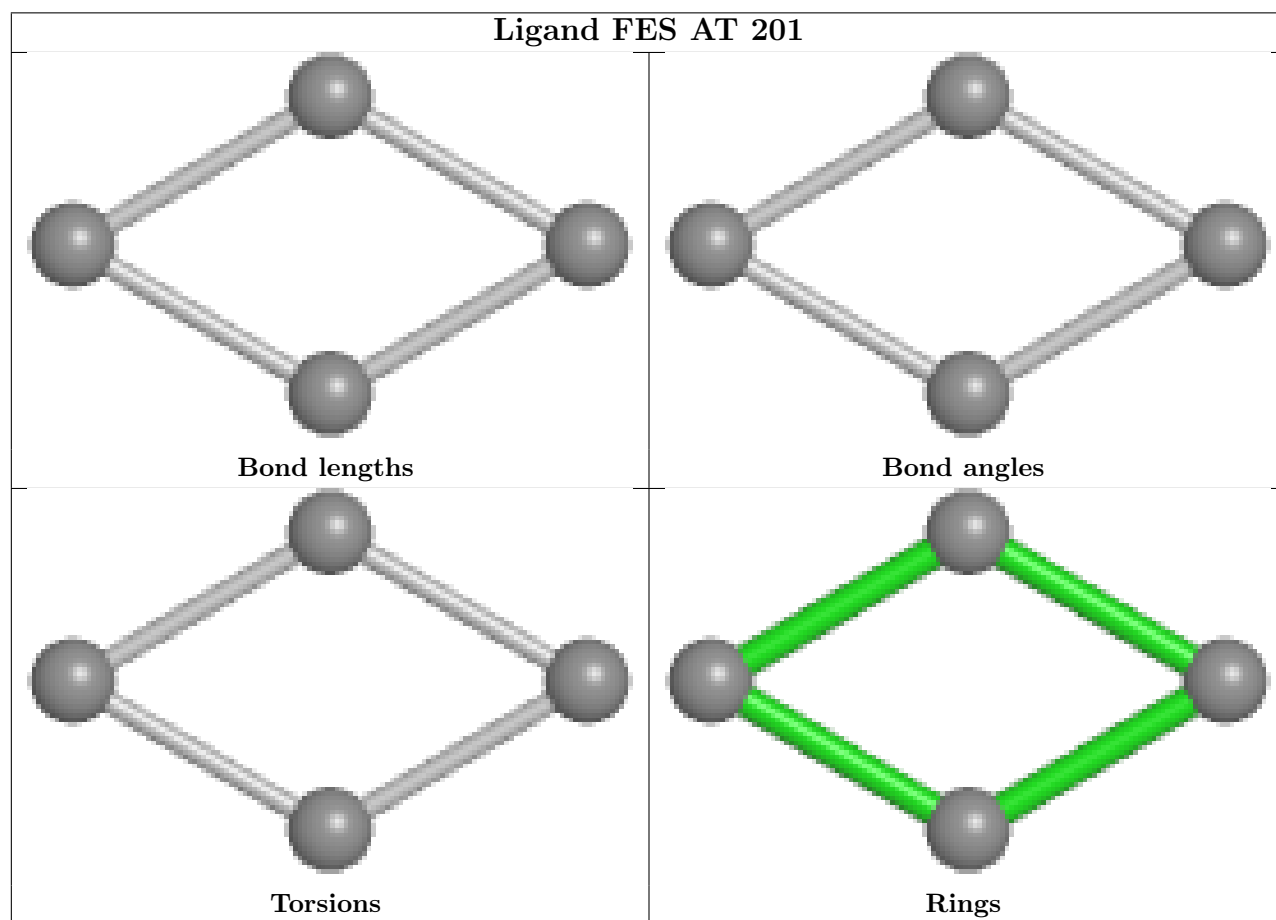
There are no ring outliers.

9 monomers are involved in 32 short contacts:

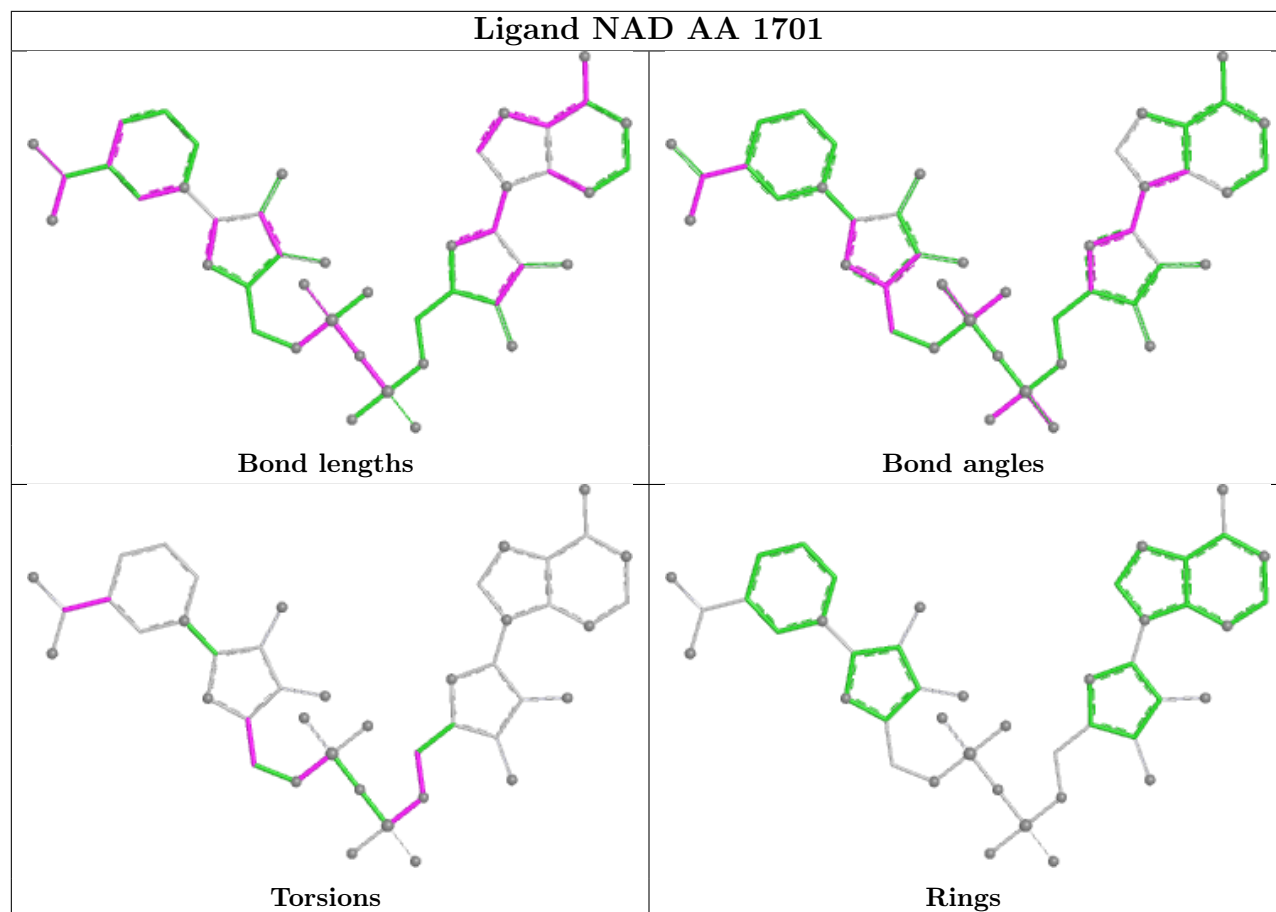
| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 92  | A     | 3471 | SPD  | 4       | 0            |
| 97  | AA    | 1701 | NAD  | 1       | 0            |
| 100 | AX    | 503  | GDP  | 1       | 0            |
| 98  | AA    | 1702 | SPM  | 3       | 0            |
| 92  | AA    | 1785 | SPD  | 5       | 0            |
| 92  | AG    | 401  | SPD  | 6       | 0            |
| 98  | AA    | 1782 | SPM  | 14      | 0            |
| 98  | AA    | 1784 | SPM  | 15      | 0            |
| 92  | A     | 3470 | SPD  | 1       | 0            |

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier.

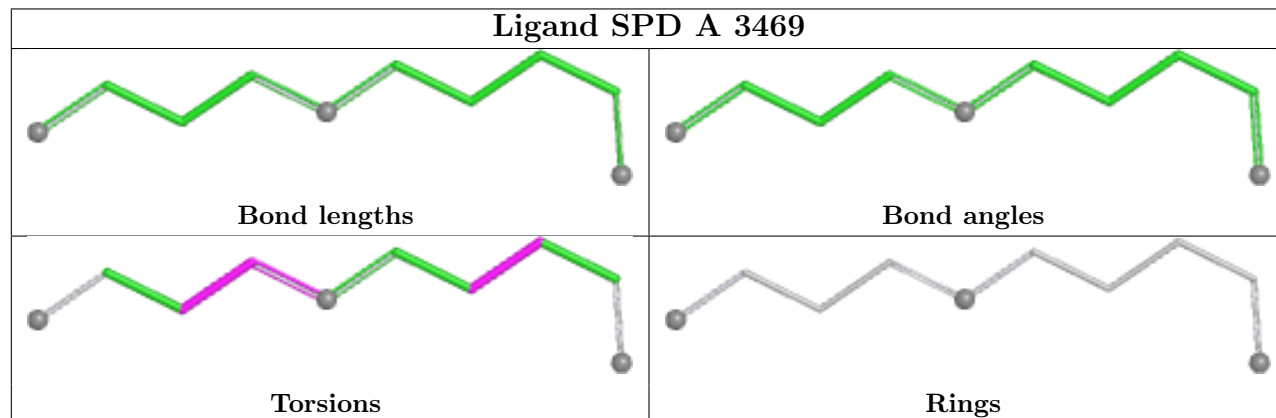
The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

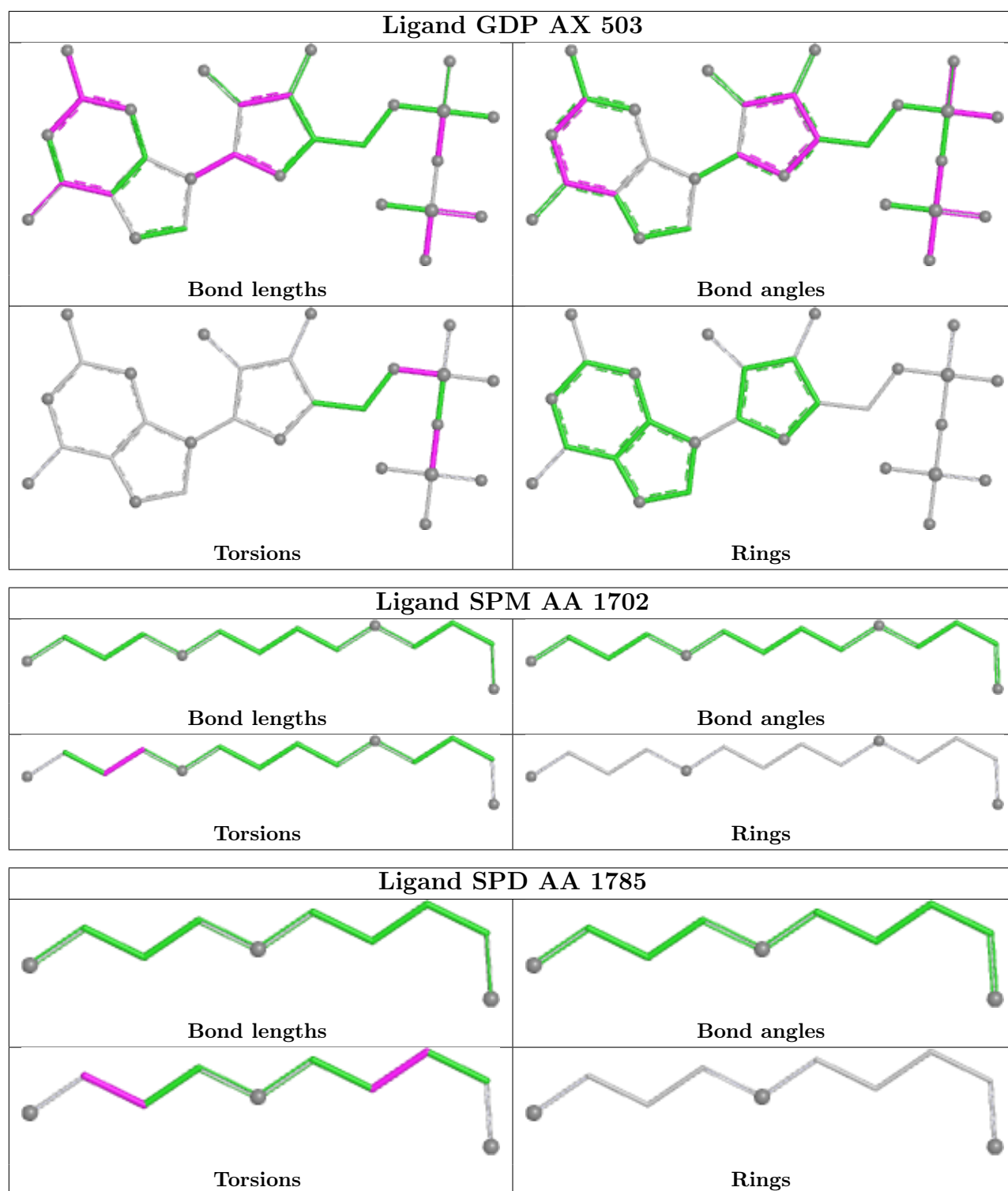


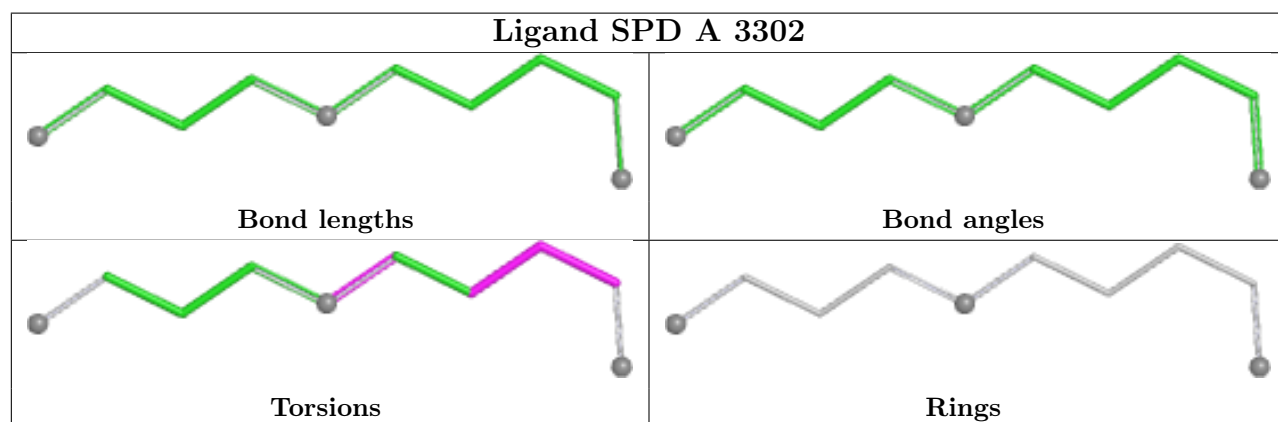
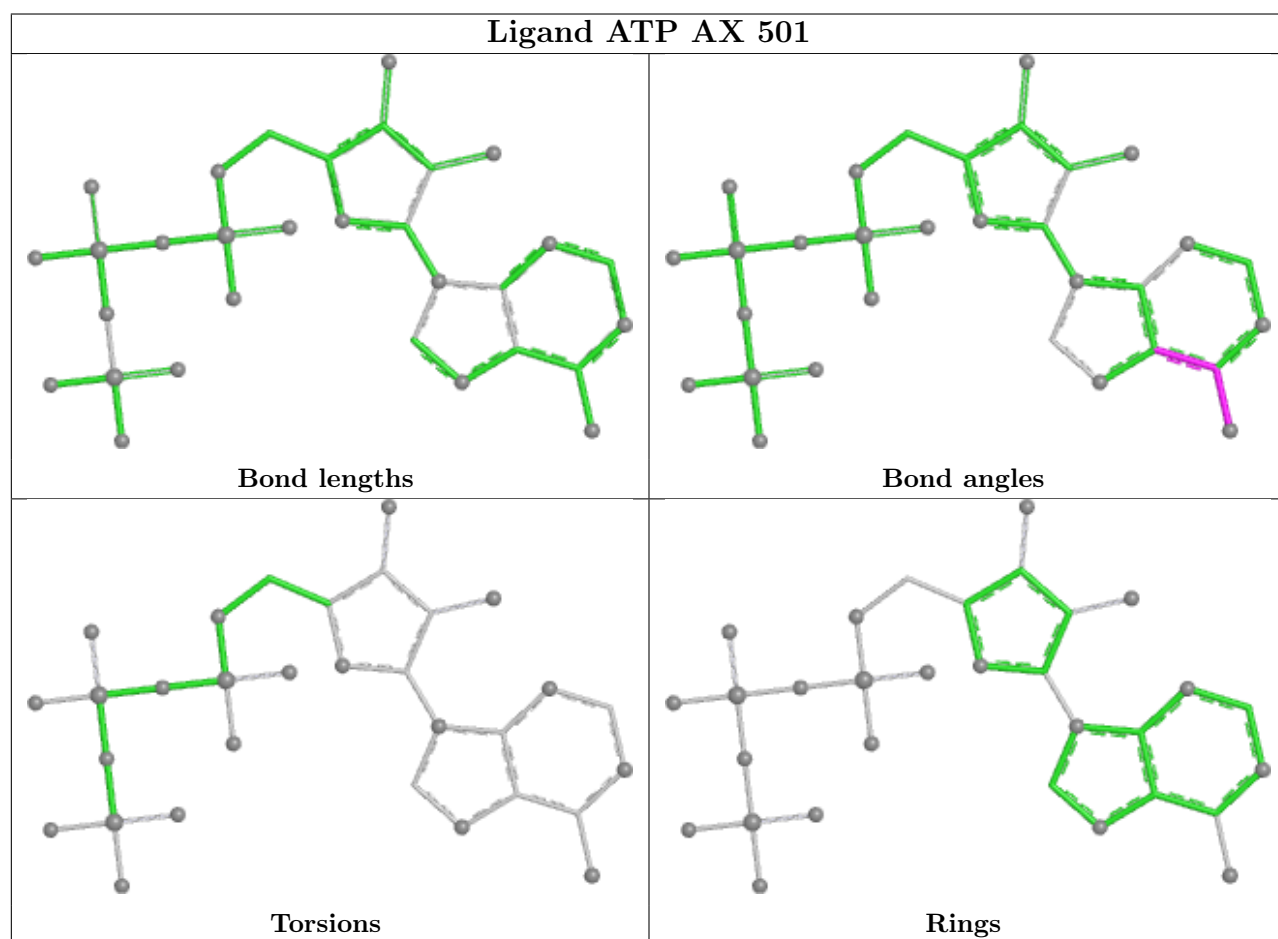
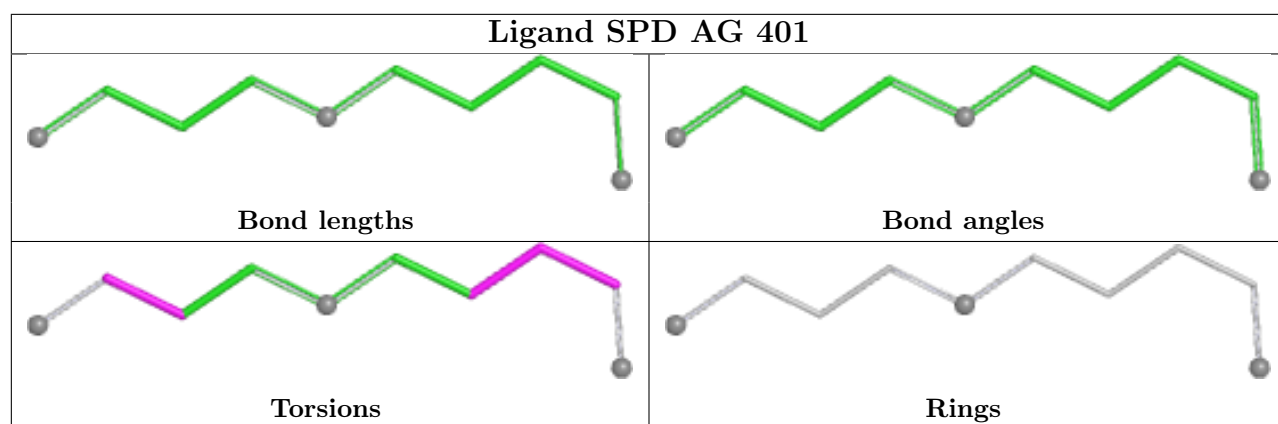
## Ligand NAD AA 1701

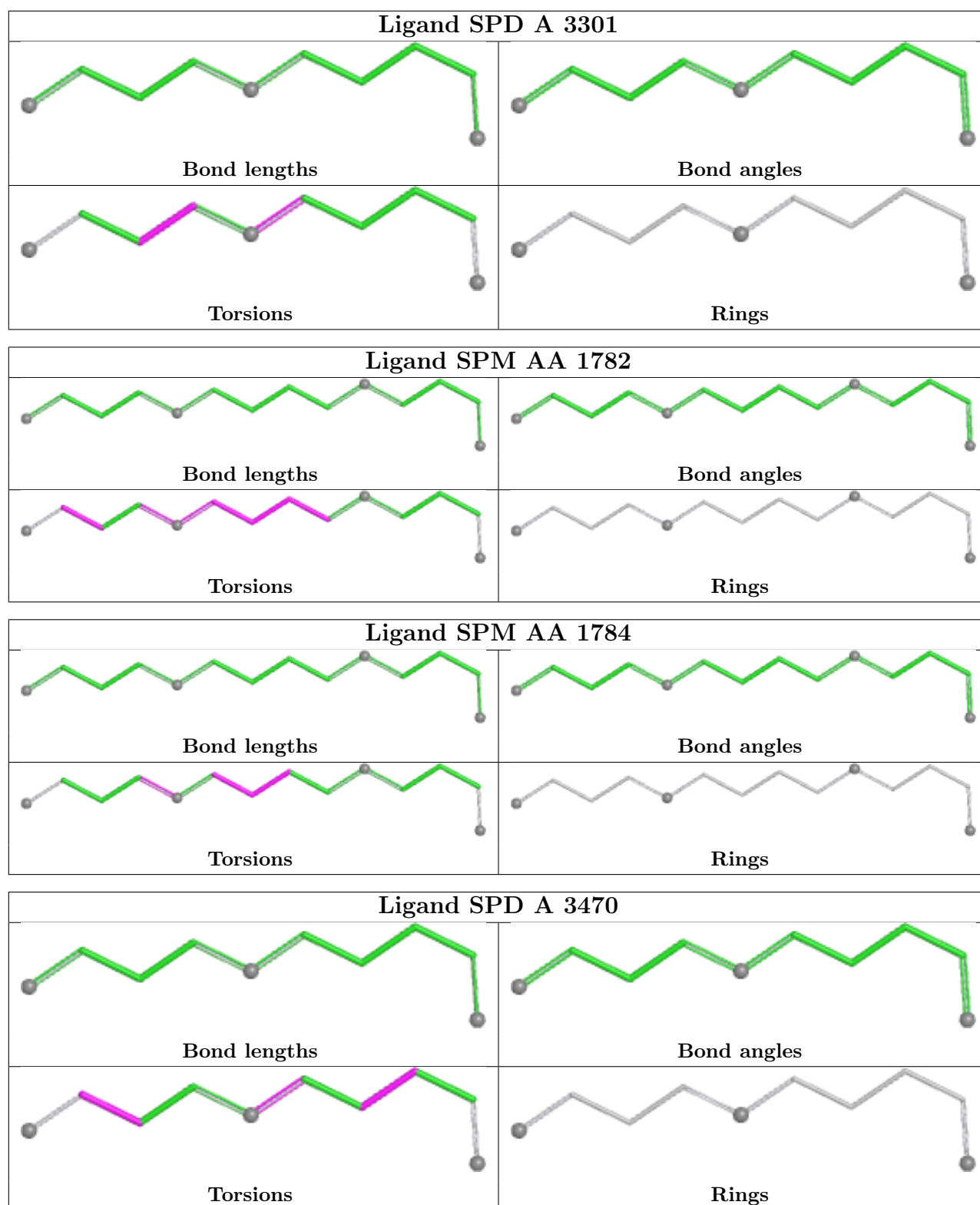


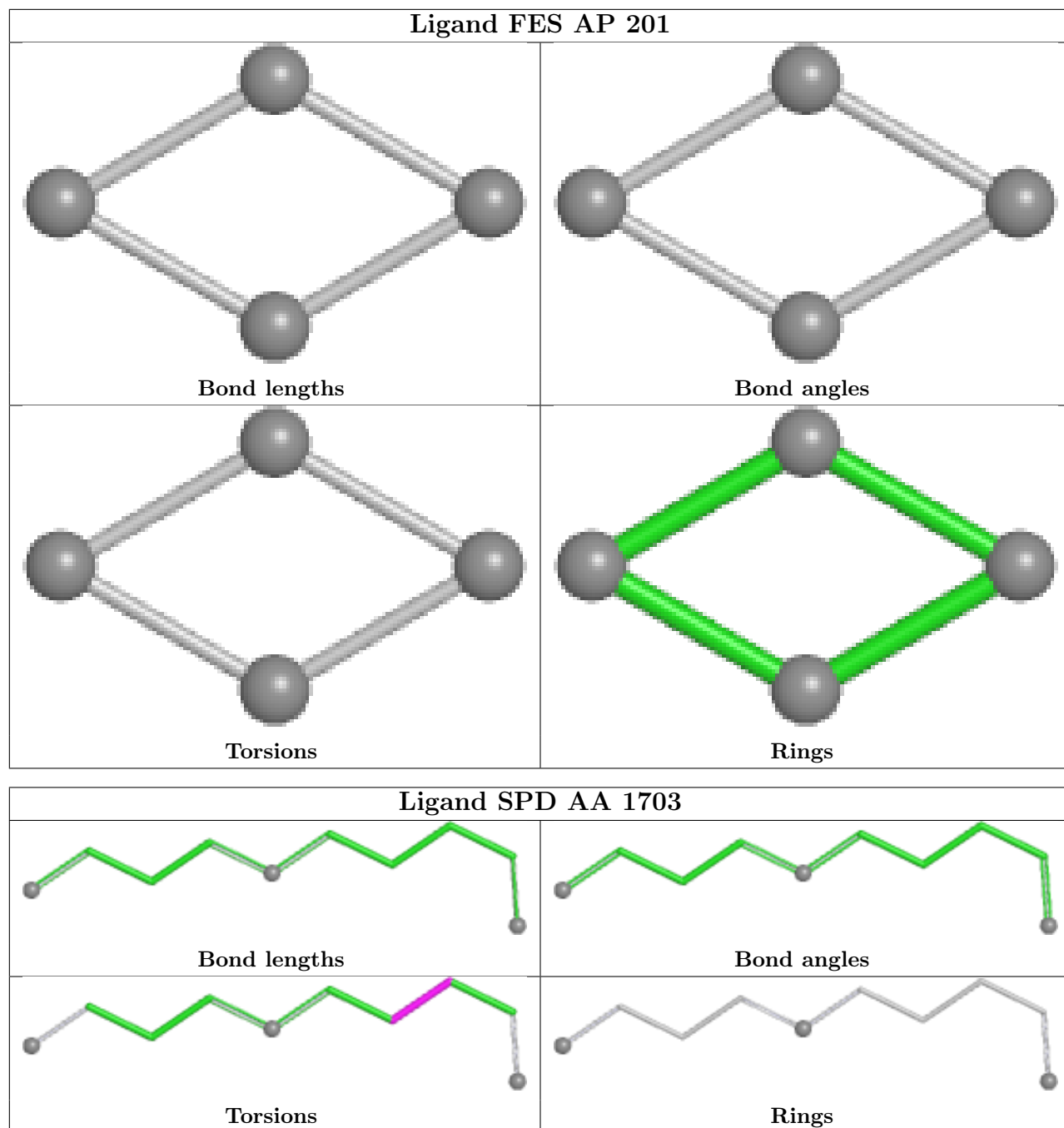
## Ligand SPD A 3469

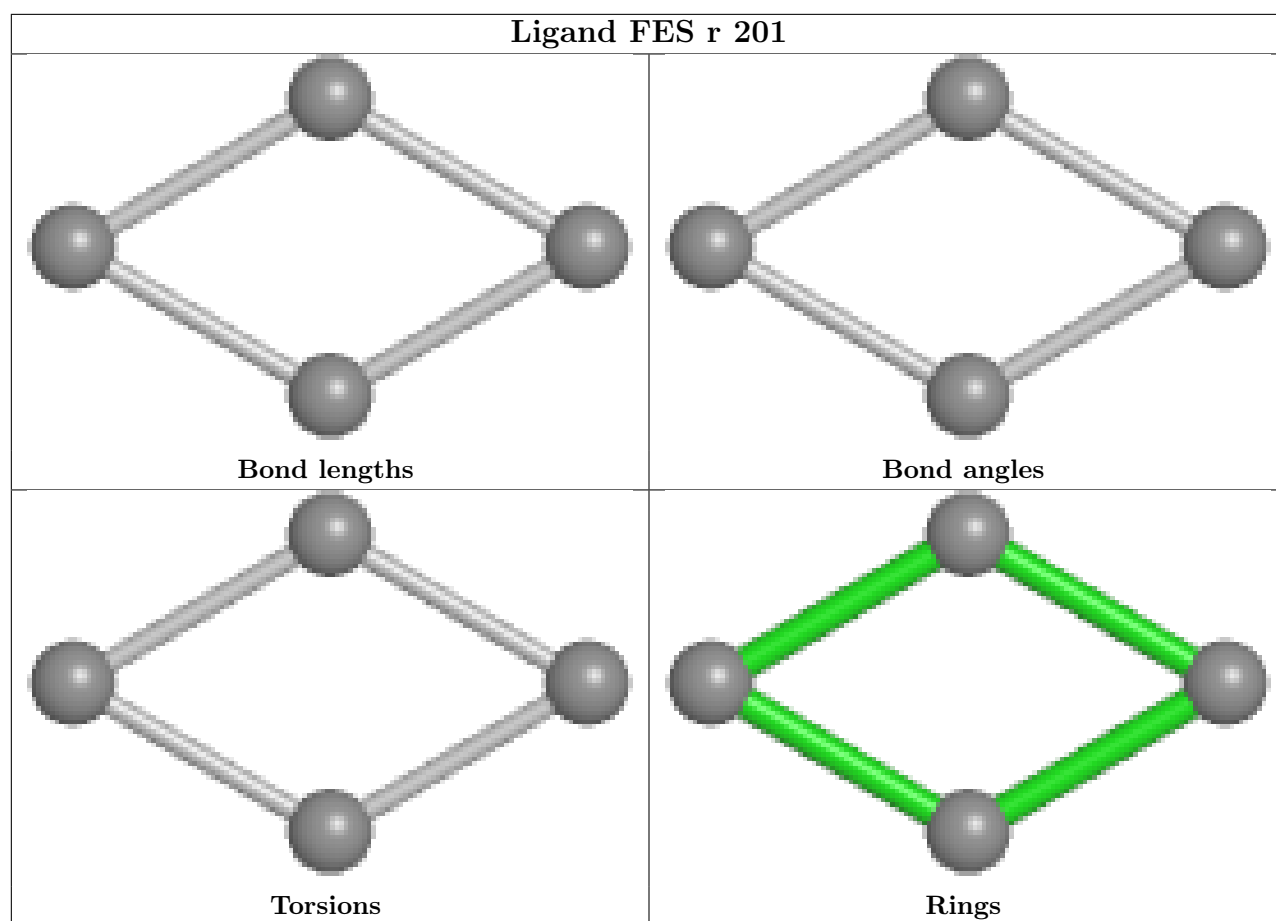












## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

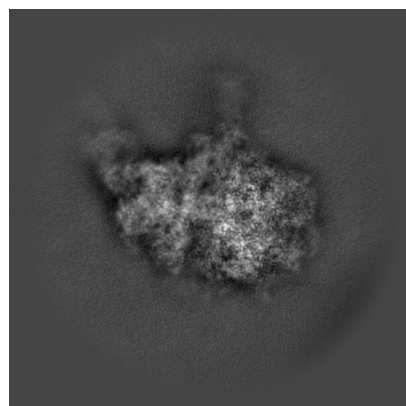
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-71630. These allow visual inspection of the internal detail of the map and identification of artifacts.

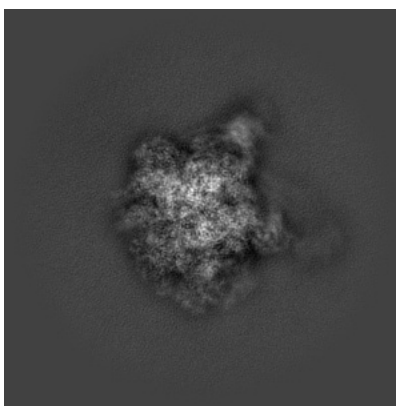
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

### 6.1 Orthogonal projections [i](#)

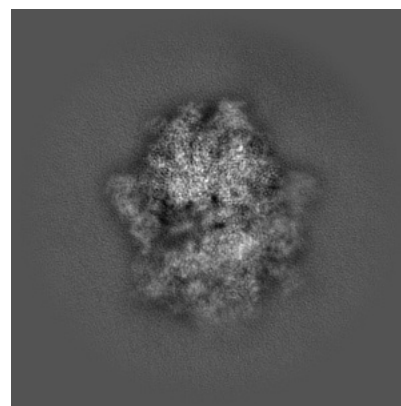
#### 6.1.1 Primary map



X

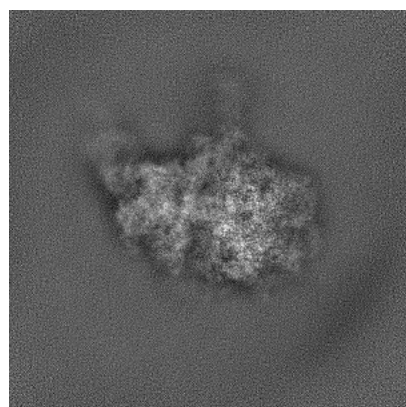


Y

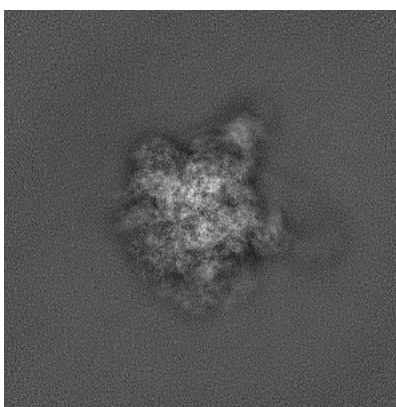


Z

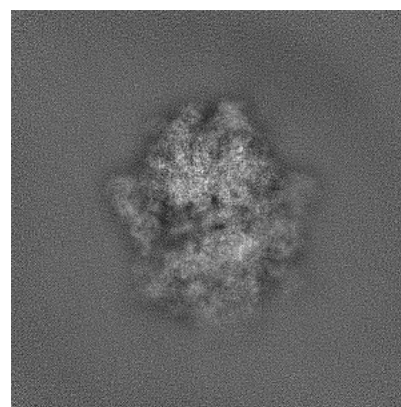
#### 6.1.2 Raw map



X



Y

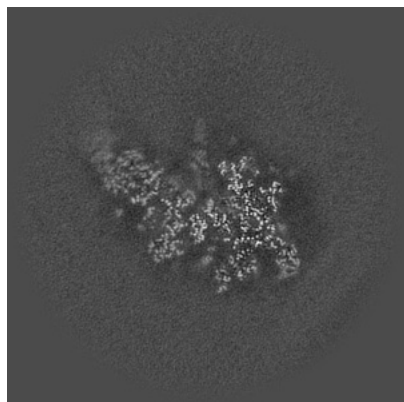


Z

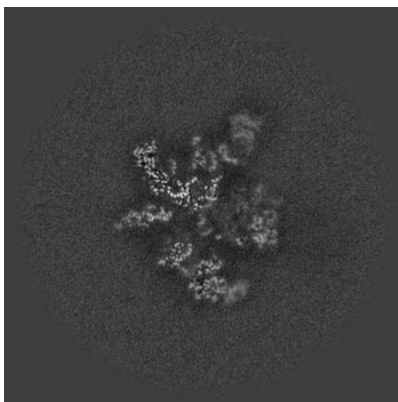
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

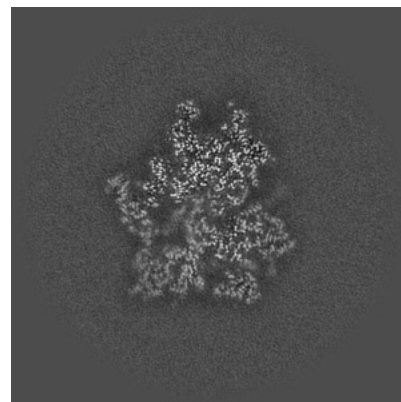
### 6.2.1 Primary map



X Index: 240

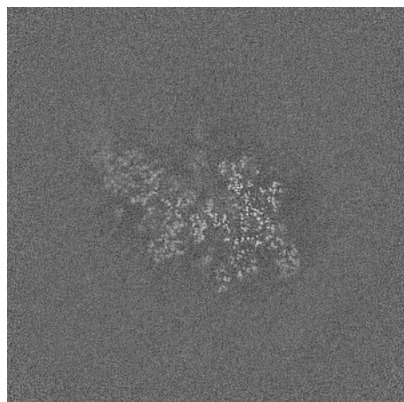


Y Index: 240

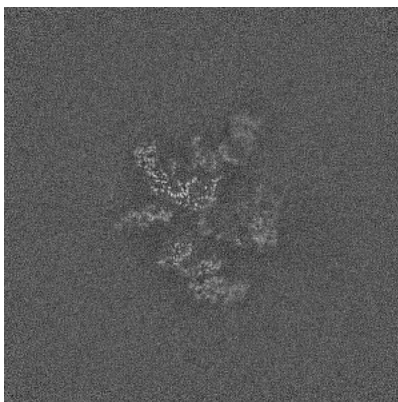


Z Index: 240

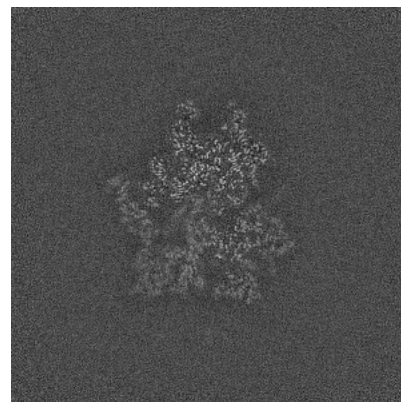
### 6.2.2 Raw map



X Index: 240



Y Index: 240

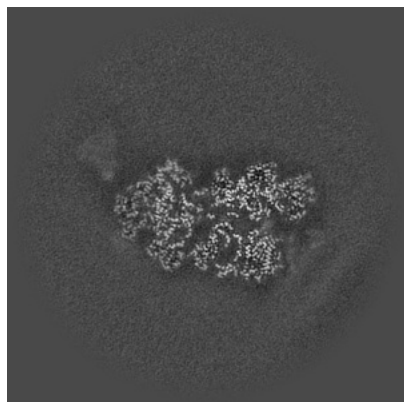


Z Index: 240

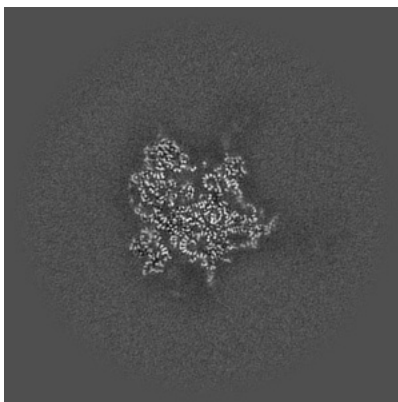
The images above show central slices of the map in three orthogonal directions.

## 6.3 Largest variance slices [i](#)

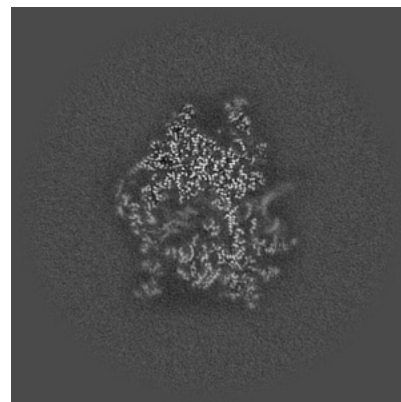
### 6.3.1 Primary map



X Index: 275

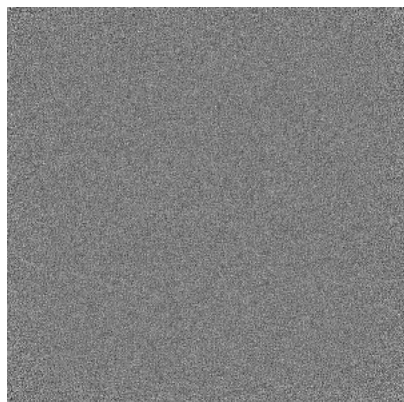


Y Index: 287

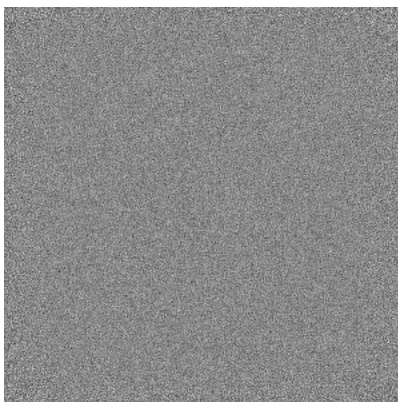


Z Index: 249

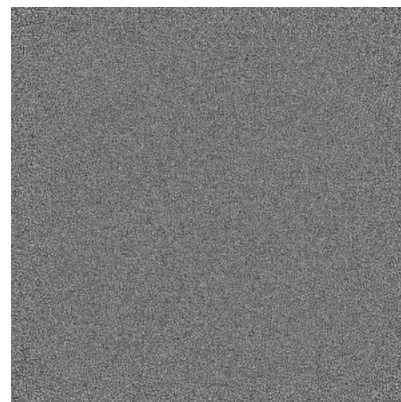
### 6.3.2 Raw map



X Index: 0



Y Index: 0

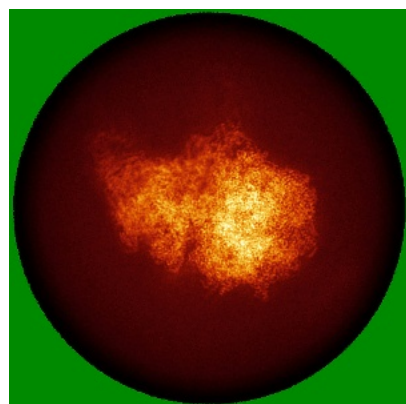


Z Index: 0

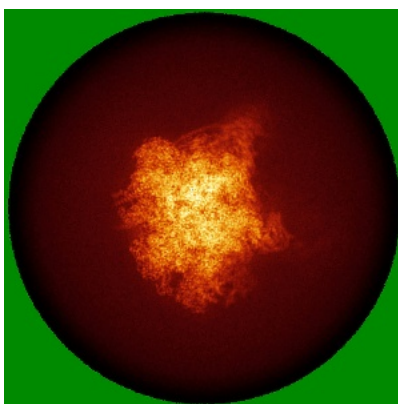
The images above show the largest variance slices of the map in three orthogonal directions.

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

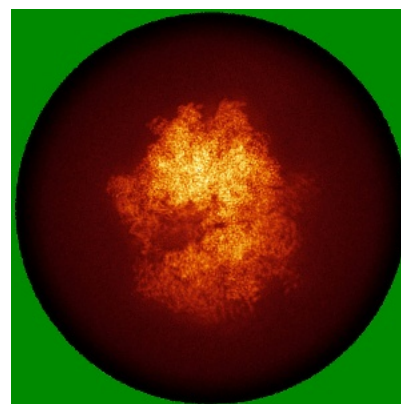
### 6.4.1 Primary map



X

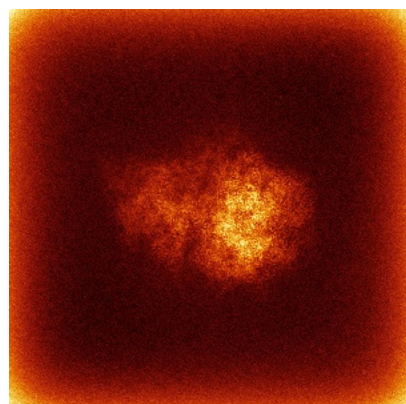


Y

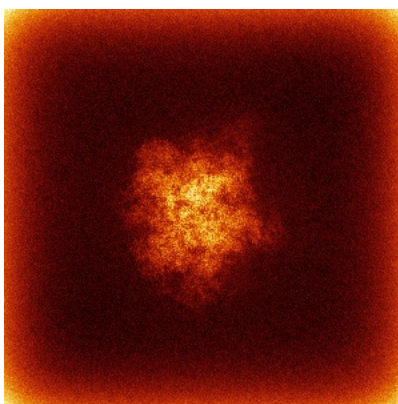


Z

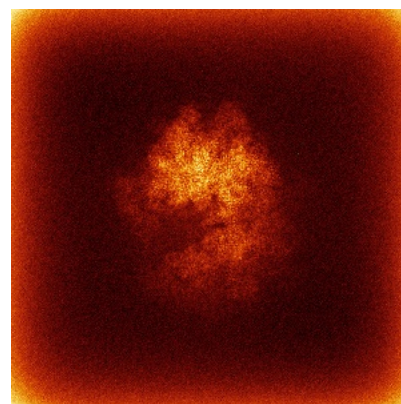
### 6.4.2 Raw map



X



Y



Z

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

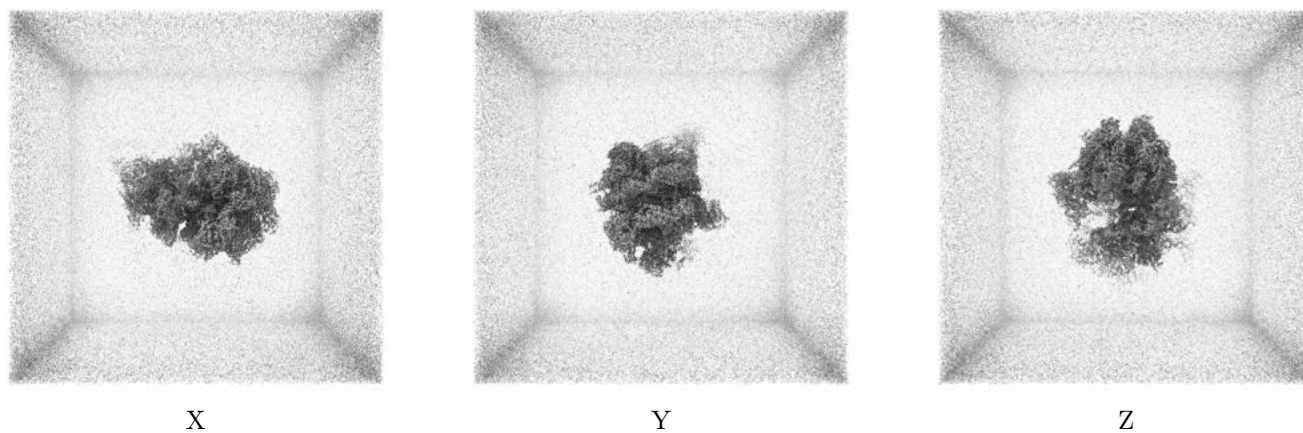
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.05. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

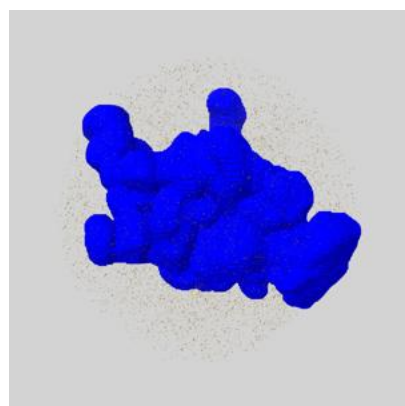
## 6.6 Mask visualisation [i](#)

This section shows the 3D surface view of the primary map at 50% transparency overlaid with the specified mask at 0% transparency

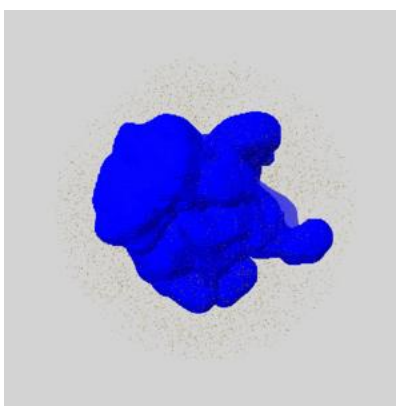
A mask typically either:

- Encompasses the whole structure
- Separates out a domain, a functional unit, a monomer or an area of interest from a larger structure

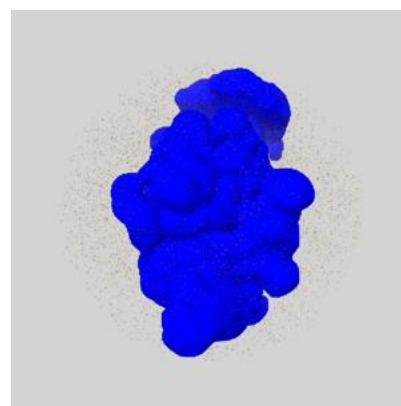
### 6.6.1 emd\_71630\_msk\_1.map [i](#)



X



Y

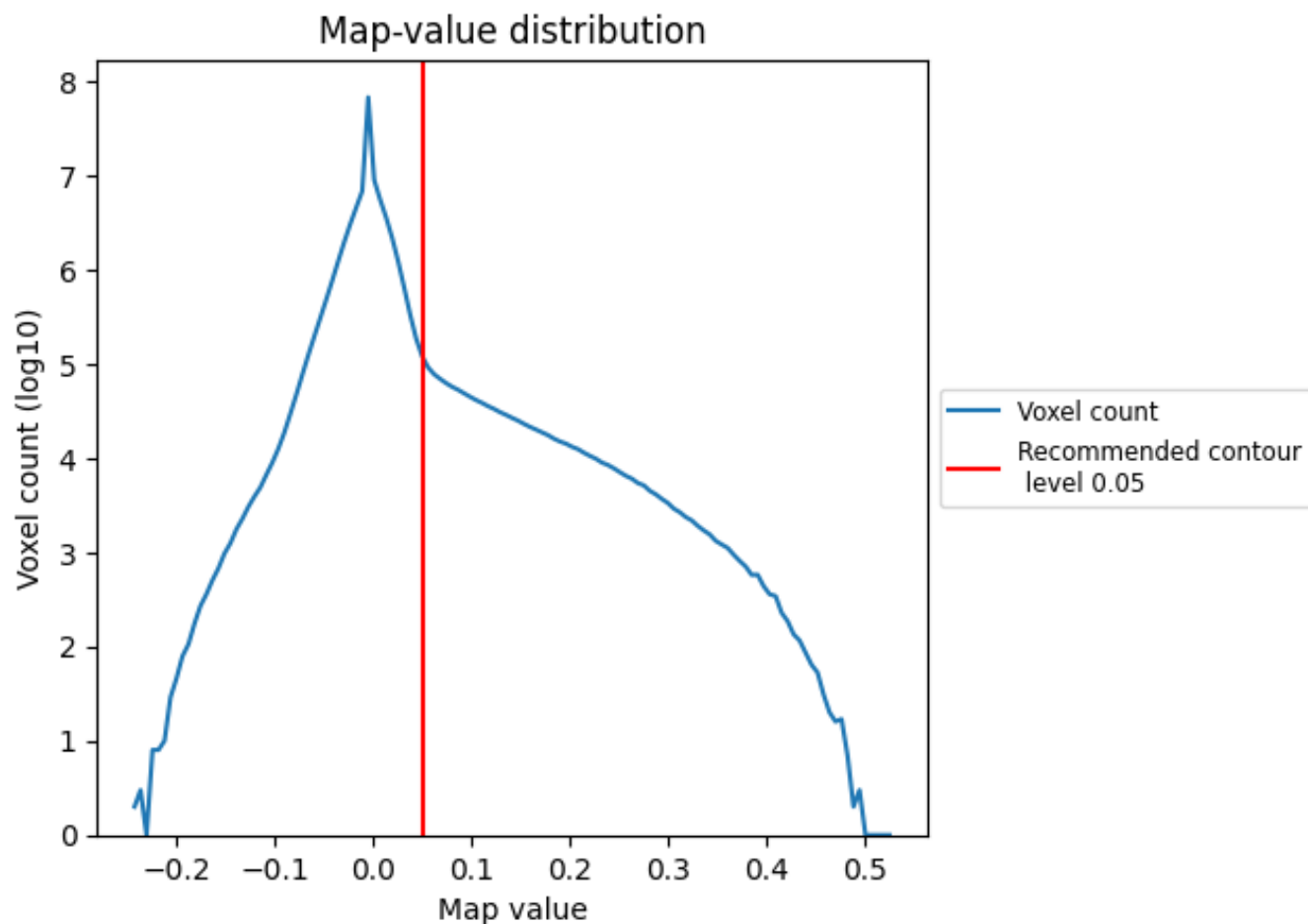


Z

## 7 Map analysis [i](#)

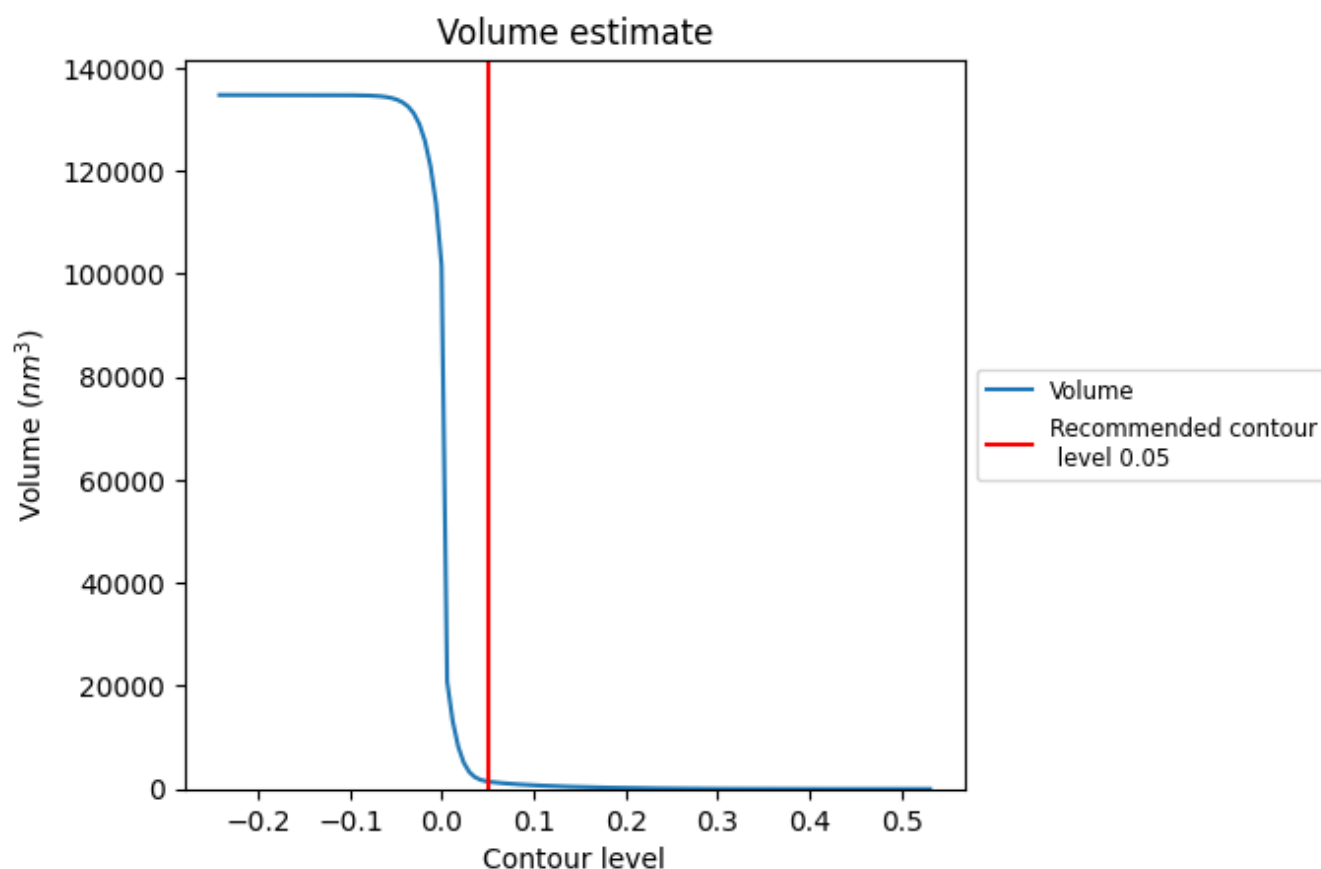
This section contains the results of statistical analysis of the map.

### 7.1 Map-value distribution [i](#)



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

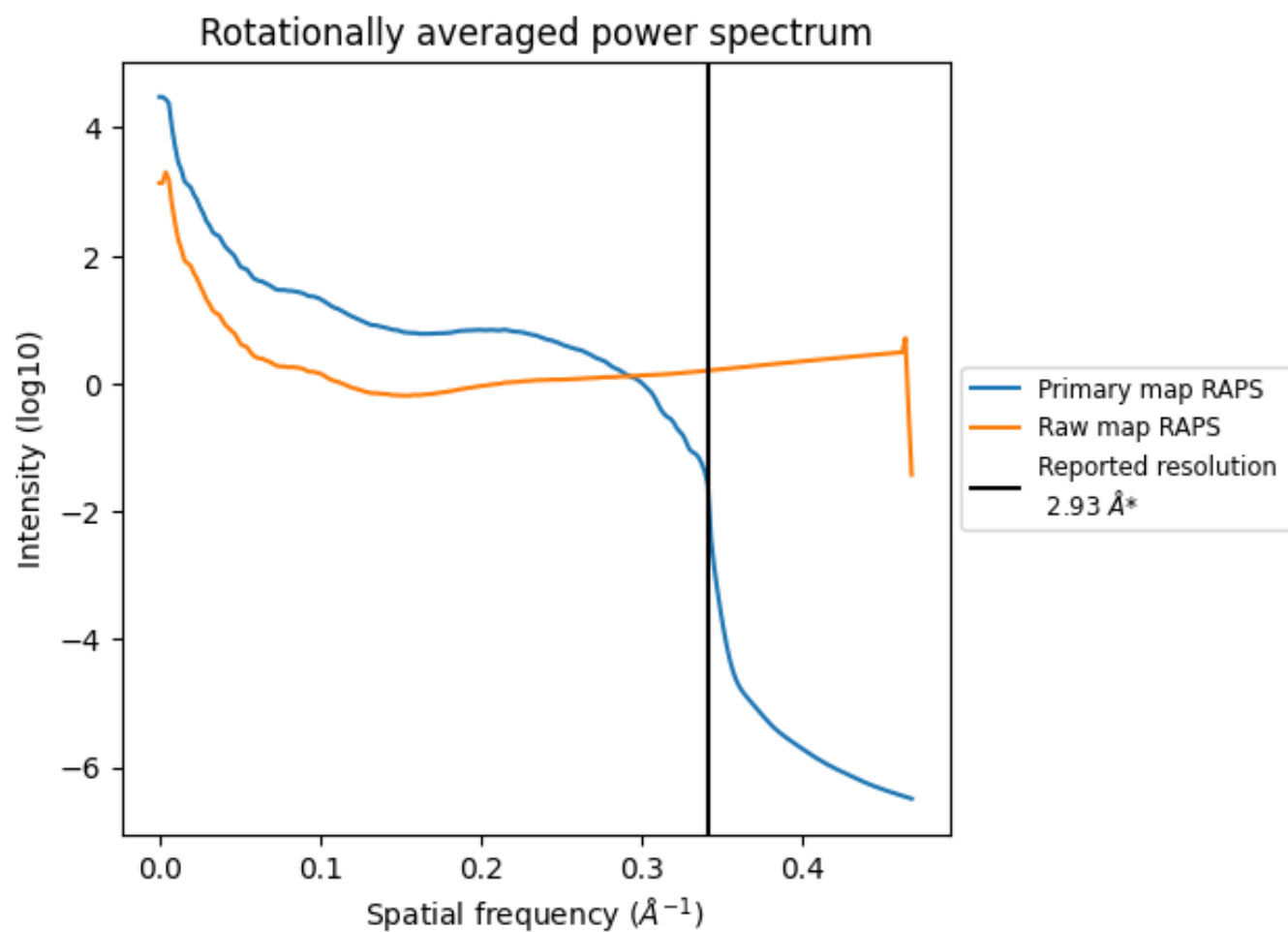
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1452 nm<sup>3</sup>; this corresponds to an approximate mass of 1312 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

### 7.3 Rotationally averaged power spectrum [i](#)

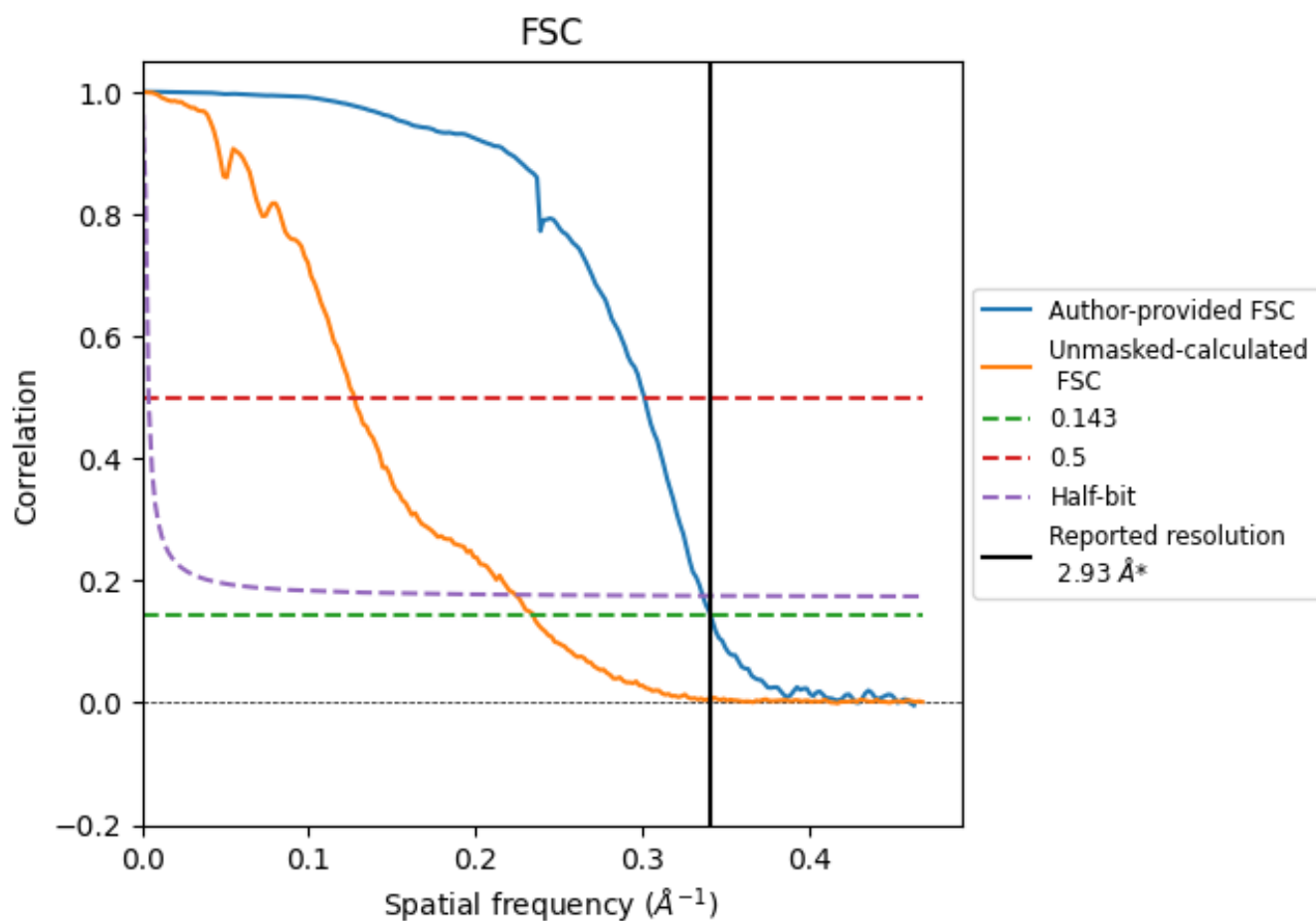


\*Reported resolution corresponds to spatial frequency of 0.341  $\text{\AA}^{-1}$

## 8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.341  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

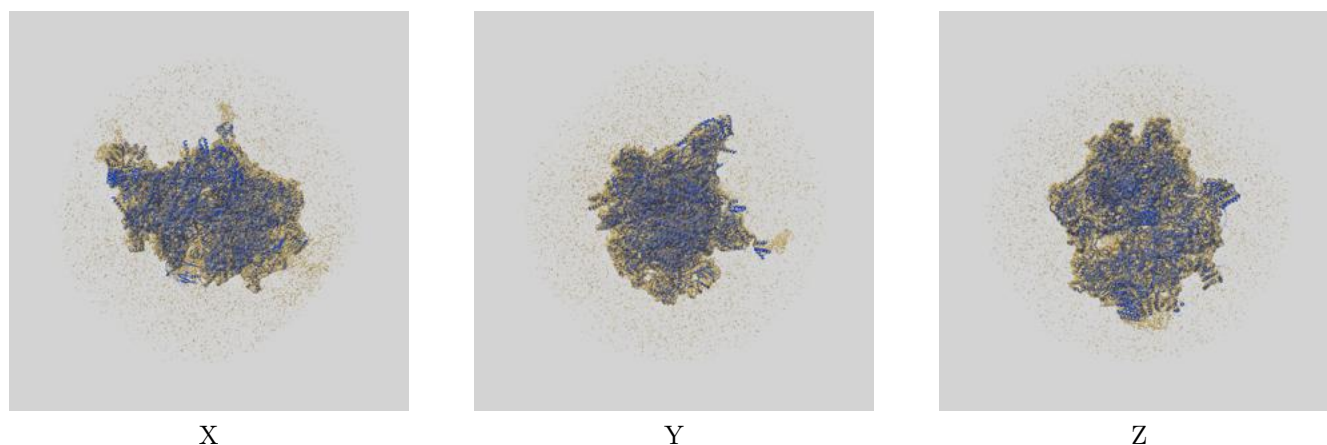
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |      |          |
|---------------------------|------------------------------------|------|----------|
|                           | 0.143                              | 0.5  | Half-bit |
| Reported by author        | 2.93                               | -    | -        |
| Author-provided FSC curve | 2.93                               | 3.32 | 2.97     |
| Unmasked-calculated*      | 4.26                               | 7.86 | 4.47     |

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 4.26 differs from the reported value 2.93 by more than 10 %

## 9 Map-model fit [i](#)

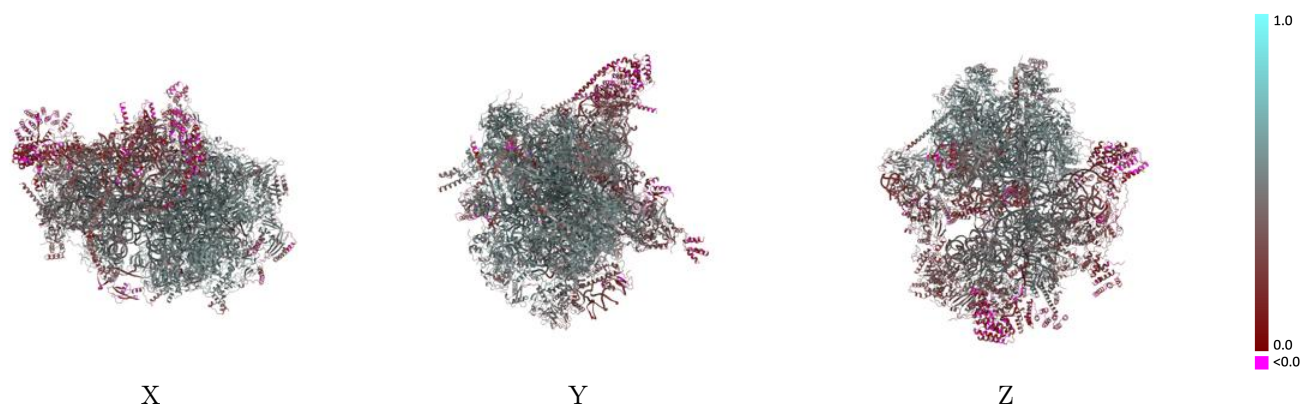
This section contains information regarding the fit between EMDB map EMD-71630 and PDB model 9PGF. Per-residue inclusion information can be found in section [3](#) on page [27](#).

### 9.1 Map-model overlay [i](#)



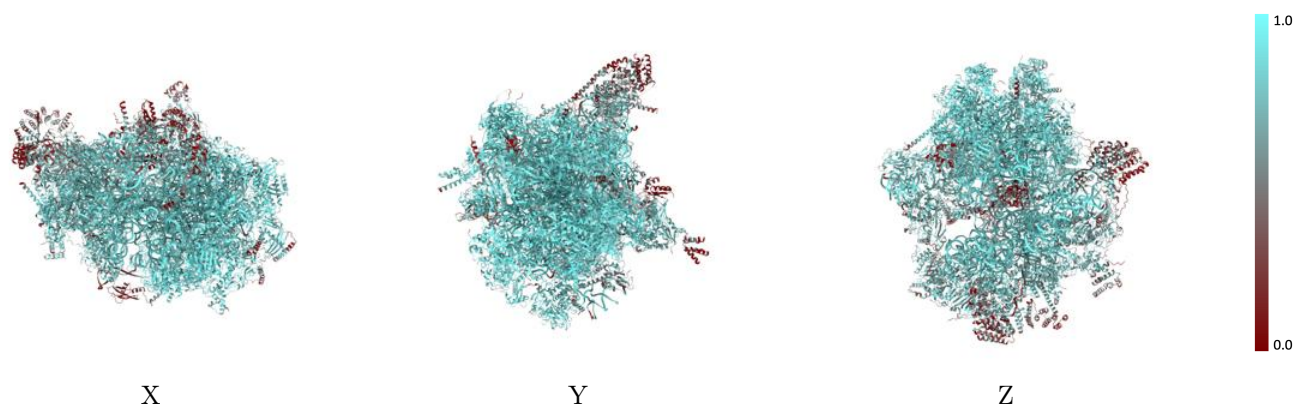
The images above show the 3D surface view of the map at the recommended contour level 0.05 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

## 9.2 Q-score mapped to coordinate model [i](#)



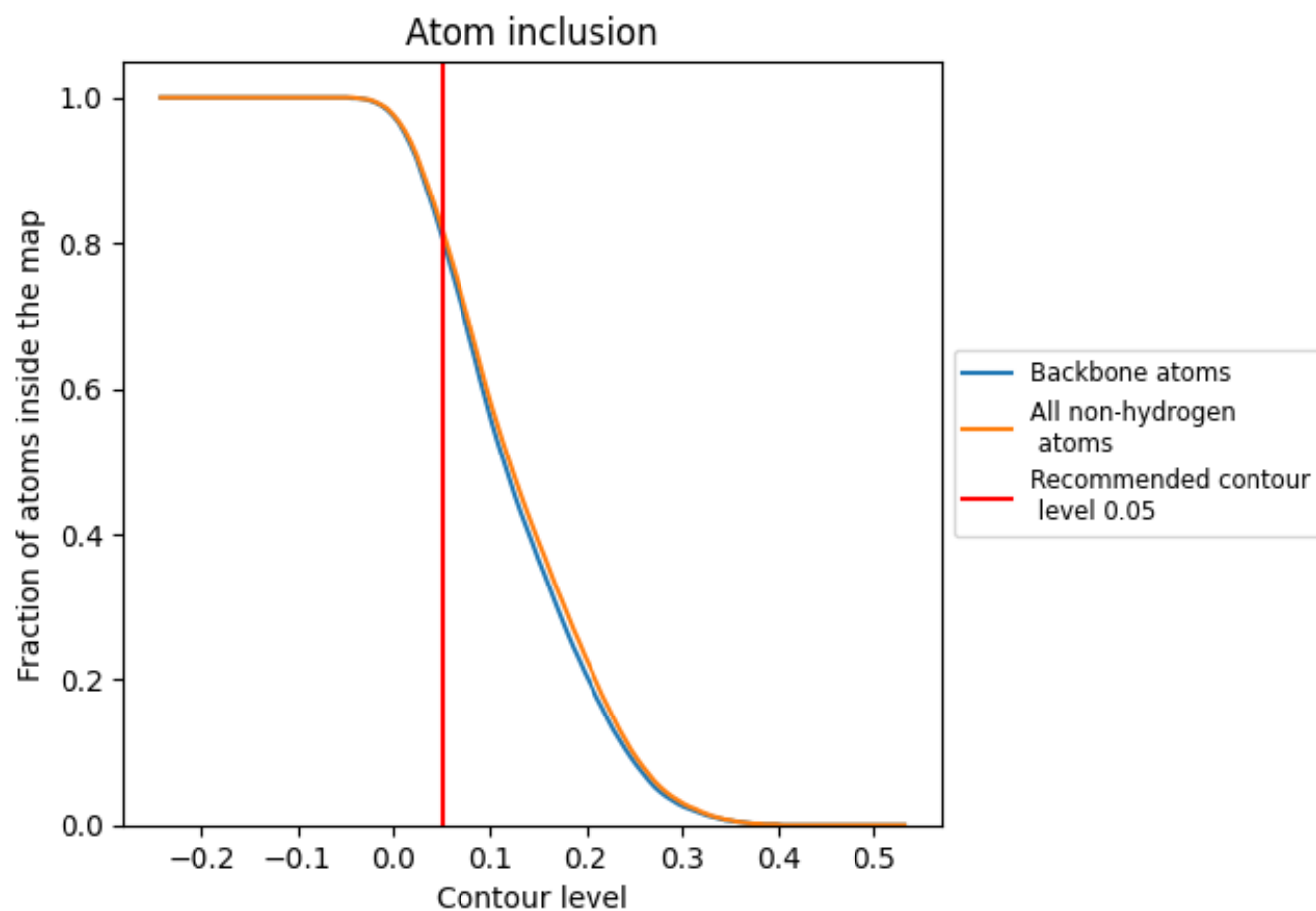
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

## 9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.05).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 81% of all backbone atoms, 82% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.05) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| All   |  0.8210   |  0.4430   |
| 0     |  0.8900   |  0.5360   |
| 1     |  0.8360   |  0.4930   |
| 2     |  0.9750   |  0.5730   |
| 3     |  0.9500   |  0.5710   |
| 4     |  0.9170   |  0.5480   |
| 5     |  0.8830   |  0.5210   |
| 6     |  0.8370   |  0.4560   |
| 7     |  0.8410   |  0.4770   |
| 8     |  0.6380   |  0.3120   |
| 9     |  0.8710   |  0.5040   |
| A     |  0.9590   |  0.5200   |
| A0    |  0.5310   |  0.2190   |
| A1    |  0.6840   |  0.3420   |
| A2    |  0.7450  |  0.4290  |
| A3    |  0.8510 |  0.4970 |
| A4    |  0.4260 |  0.1690 |
| AA    |  0.9590 |  0.4590 |
| AB    |  0.8140 |  0.4530 |
| AC    |  0.7800 |  0.4480 |
| AD    |  0.7530 |  0.4170 |
| AE    |  0.8000 |  0.4770 |
| AF    |  0.7870 |  0.4210 |
| AG    |  0.7280 |  0.4000 |
| AH    |  0.7030 |  0.3980 |
| AI    |  0.8330 |  0.4760 |
| AJ    |  0.7790 |  0.4660 |
| AK    |  0.8310 |  0.4360 |
| AL    |  0.7700 |  0.4330 |
| AM    |  0.6320 |  0.2780 |
| AN    |  0.7620 |  0.4440 |
| AO    |  0.6620 |  0.3230 |
| AP    |  0.8350 |  0.4800 |
| AQ    |  0.8770 |  0.5010 |
| AR    |  0.5760 |  0.2510 |



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| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| AS    |  0.7580   |  0.3950   |
| AT    |  0.7550   |  0.3970   |
| AU    |  0.6620   |  0.2950   |
| AV    |  0.3470   |  0.1240   |
| AW    |  0.7700   |  0.4470   |
| AX    |  0.7250   |  0.3510   |
| AY    |  0.6280   |  0.3000   |
| AZ    |  0.7330   |  0.3740   |
| Ax    |  0.8710   |  0.3880   |
| Az    |  0.5450   |  0.2530   |
| B     |  0.8430   |  0.3280   |
| C     |  0.3250   |  0.2880   |
| D     |  0.9230   |  0.5540   |
| E     |  0.9020   |  0.5430   |
| F     |  0.9320   |  0.5500   |
| G     |  0.1160   |  0.1570   |
| H     |  0.4730   |  0.2940   |
| I     |  0.7070  |  0.3760  |
| J     |  0.6290 |  0.2760 |
| K     |  0.9280 |  0.5480 |
| L     |  0.9090 |  0.5380 |
| M     |  0.9110 |  0.5380 |
| N     |  0.8920 |  0.5320 |
| O     |  0.9230 |  0.5440 |
| OX    |  0.5500 |  0.3040 |
| P     |  0.8700 |  0.4940 |
| Q     |  0.8280 |  0.5020 |
| R     |  0.9310 |  0.5520 |
| S     |  0.9040 |  0.5440 |
| T     |  0.9310 |  0.5610 |
| U     |  0.8190 |  0.4840 |
| V     |  0.8630 |  0.4980 |
| W     |  0.9060 |  0.5520 |
| X     |  0.8820 |  0.5220 |
| Y     |  0.9030 |  0.5350 |
| Z     |  0.9130 |  0.5440 |
| a     |  0.7750 |  0.4760 |
| b     |  0.9200 |  0.5430 |
| c     |  0.8730 |  0.5060 |
| d     |  0.7340 |  0.4390 |
| e     |  0.5960 |  0.2620 |
| f     |  0.6860 |  0.3690 |

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| Chain | Atom inclusion                                                                           | Q-score                                                                                  |
|-------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| g     |  0.8960 |  0.5280 |
| h     |  0.8560 |  0.4700 |
| i     |  0.9420 |  0.5660 |
| j     |  0.8380 |  0.4890 |
| k     |  0.7420 |  0.3980 |
| l     |  0.6800 |  0.3310 |
| m     |  0.5910 |  0.2760 |
| n     |  0.5720 |  0.3420 |
| o     |  0.9410 |  0.5600 |
| p     |  0.7590 |  0.4260 |
| q     |  0.6670 |  0.3570 |
| r     |  0.8850 |  0.5240 |
| s     |  0.8930 |  0.5280 |
| t     |  0.2720 |  0.1800 |
| u     |  0.2110 |  0.1320 |