



## Full wwPDB EM Validation Report ⓘ

Jul 8, 2025 – 03:58 PM JST

PDB ID : 8H6K / pdb\_00008h6k  
EMDB ID : EMD-34507  
Title : Cryo-EM structure of human exon-defined spliceosome in the mature B state.  
Authors : Zhang, W.; Zhan, X.; Zhang, X.; Bai, R.; Lei, J.; Yan, C.; Shi, Y.  
Deposited on : 2022-10-18  
Resolution : 2.70 Å(reported)

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

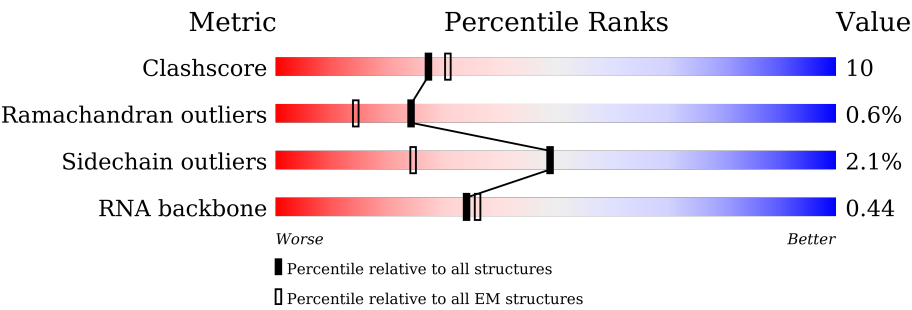
EMDB validation analysis : **FAILED**  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
MolProbity : 4-5-2 with Phenix2.0rc1  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)  
MapQ : **FAILED**  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.44

# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:  
*ELECTRON MICROSCOPY*

The reported resolution of this entry is 2.70 Å.

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



| Metric                | Whole archive (#Entries) | EM structures (#Entries) |
|-----------------------|--------------------------|--------------------------|
| Clashscore            | 210492                   | 15764                    |
| Ramachandran outliers | 207382                   | 16835                    |
| Sidechain outliers    | 206894                   | 16415                    |
| RNA backbone          | 6643                     | 2191                     |

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$

| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 1   | A     | 144    | 8% 12% 21% . 56% |
| 2   | 5A    | 117    | 46% 38% 15% .    |
| 3   | 5B    | 2335   | 84% 12% . .      |
| 4   | 5C    | 972    | 65% 18% . 16%    |
| 5   | 5D    | 2136   | 61% 18% 21%      |
| 6   | 5E    | 357    | 79% . 16%        |
| 7   | 2a    | 231    | 36% . 63%        |
| 7   | 4a    | 231    | 26% . 72%        |

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| Mol | Chain | Length | Quality of chain                                                                     |
|-----|-------|--------|--------------------------------------------------------------------------------------|
| 7   | 5a    | 231    |    |
| 8   | 2b    | 119    |    |
| 8   | 4b    | 119    |    |
| 8   | 5b    | 119    |    |
| 9   | 2c    | 118    |    |
| 9   | 4c    | 118    |    |
| 9   | 5c    | 118    |    |
| 10  | 2d    | 86     |    |
| 10  | 4d    | 86     |    |
| 10  | 5d    | 86     |    |
| 11  | 2e    | 92     |    |
| 11  | 4e    | 92     |   |
| 11  | 5e    | 92     |  |
| 12  | 2f    | 76     |  |
| 12  | 4f    | 76     |  |
| 12  | 5f    | 76     |  |
| 13  | 2g    | 126    |  |
| 13  | 4g    | 126    |  |
| 13  | 5g    | 126    |  |
| 14  | 6A    | 107    |  |
| 15  | 6a    | 95     |  |
| 16  | 6b    | 102    |  |
| 17  | 6c    | 139    |  |
| 18  | 6d    | 91     |  |
| 19  | 6e    | 80     |  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 20  | 6f    | 103    |                  |
| 21  | 6g    | 96     |                  |
| 22  | 4A    | 145    |                  |
| 23  | 4B    | 683    |                  |
| 24  | 4C    | 522    |                  |
| 25  | 4D    | 499    |                  |
| 26  | 4E    | 128    |                  |
| 27  | 4F    | 142    |                  |
| 28  | 4G    | 941    |                  |
| 29  | 4H    | 177    |                  |
| 30  | 4I    | 376    |                  |
| 31  | 4J    | 800    |                  |
| 32  | 4K    | 439    |                  |
| 33  | 4L    | 312    |                  |
| 34  | 4M    | 73     |                  |
| 35  | 4N    | 199    |                  |
| 36  | 4Z    | 513    |                  |
| 37  | 2A    | 188    |                  |
| 38  | 2B    | 255    |                  |
| 39  | 2C    | 225    |                  |
| 40  | 2D    | 793    |                  |
| 41  | 2E    | 464    |                  |
| 42  | 2F    | 501    |                  |
| 43  | 2G    | 1304   |                  |
| 44  | 2H    | 895    |                  |

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| Mol | Chain | Length | Quality of chain                                                 |
|-----|-------|--------|------------------------------------------------------------------|
| 45  | 2I    | 1217   | <div><div></div><div>83%</div><div>13%</div><div></div></div>    |
| 46  | 2J    | 424    | <div><div>17%</div><div></div><div>82%</div><div></div></div>    |
| 47  | 2K    | 125    | <div><div></div><div>74%</div><div>12%</div><div>14%</div></div> |
| 48  | 2L    | 110    | <div><div></div><div>75%</div><div>6%</div><div>19%</div></div>  |
| 49  | 2M    | 86     | <div><div></div><div>53%</div><div>22%</div><div>23%</div></div> |

## 2 Entry composition

There are 53 unique types of molecules in this entry. The entry contains 98459 atoms, of which 0 are hydrogens and 0 are deuteriums.

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

- Molecule 1 is a RNA chain called pre-mRNA.

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 1   | A     | 64       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 1334  | 597 | 209 | 464 | 64 |         |       |

- Molecule 2 is a RNA chain called U5 snRNA.

| Mol | Chain | Residues | Atoms |      |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
| 2   | 5A    | 115      | Total | C    | N   | O   | P   | 0       | 0     |
|     |       |          | 2420  | 1084 | 403 | 818 | 115 |         |       |

- Molecule 3 is a protein called Pre-mRNA-processing-splicing factor 8.

| Mol | Chain | Residues | Atoms |       |      |      |    | AltConf | Trace |
|-----|-------|----------|-------|-------|------|------|----|---------|-------|
| 3   | 5B    | 2253     | Total | C     | N    | O    | S  | 0       | 0     |
|     |       |          | 18639 | 11991 | 3249 | 3318 | 81 |         |       |

- Molecule 4 is a protein called 116 kDa U5 small nuclear ribonucleoprotein component.

| Mol | Chain | Residues | Atoms |      |      |      |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|----|---------|-------|
| 4   | 5C    | 818      | Total | C    | N    | O    | S  | 0       | 0     |
|     |       |          | 6430  | 4108 | 1085 | 1205 | 32 |         |       |

- Molecule 5 is a protein called U5 small nuclear ribonucleoprotein 200 kDa helicase.

| Mol | Chain | Residues | Atoms |      |      |      |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|----|---------|-------|
| 5   | 5D    | 1696     | Total | C    | N    | O    | S  | 0       | 0     |
|     |       |          | 13633 | 8715 | 2329 | 2519 | 70 |         |       |

- Molecule 6 is a protein called U5 small nuclear ribonucleoprotein 40 kDa protein.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 6   | 5E    | 299      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 1196  | 598 | 299 | 299 |         |       |

- Molecule 7 is a protein called Isoform SM-B of Small nuclear ribonucleoprotein-associated proteins B and B'.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 7   | 5a    | 84       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 336   | 168 | 84 | 84 |         |       |
| 7   | 4a    | 64       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 256   | 128 | 64 | 64 |         |       |
| 7   | 2a    | 86       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 344   | 172 | 86 | 86 |         |       |

- Molecule 8 is a protein called Small nuclear ribonucleoprotein Sm D1.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 8   | 5b    | 82       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 328   | 164 | 82 | 82 |         |       |
| 8   | 4b    | 82       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 334   | 170 | 82 | 82 |         |       |
| 8   | 2b    | 82       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 328   | 164 | 82 | 82 |         |       |

- Molecule 9 is a protein called Small nuclear ribonucleoprotein Sm D2.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 9   | 5c    | 97       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 388   | 194 | 97 | 97 |         |       |
| 9   | 4c    | 74       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 300   | 152 | 74 | 74 |         |       |
| 9   | 2c    | 85       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 340   | 170 | 85 | 85 |         |       |

- Molecule 10 is a protein called Small nuclear ribonucleoprotein F.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 10  | 5d    | 74       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 296   | 148 | 74 | 74 |         |       |
| 10  | 4d    | 71       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 292   | 150 | 71 | 71 |         |       |
| 10  | 2d    | 74       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 296   | 148 | 74 | 74 |         |       |

- Molecule 11 is a protein called Small nuclear ribonucleoprotein E.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 11  | 5e    | 79       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 316   | 158 | 79 | 79 |         |       |
| 11  | 4e    | 78       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 314   | 158 | 78 | 78 |         |       |
| 11  | 2e    | 79       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 316   | 158 | 79 | 79 |         |       |

- Molecule 12 is a protein called Small nuclear ribonucleoprotein G.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 12  | 5f    | 72       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 288   | 144 | 72 | 72 |         |       |
| 12  | 4f    | 73       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 298   | 152 | 73 | 73 |         |       |
| 12  | 2f    | 68       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 272   | 136 | 68 | 68 |         |       |

- Molecule 13 is a protein called Small nuclear ribonucleoprotein Sm D3.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 13  | 5g    | 77       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 308   | 154 | 77 | 77 |         |       |
| 13  | 4g    | 71       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 288   | 146 | 71 | 71 |         |       |
| 13  | 2g    | 80       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 320   | 160 | 80 | 80 |         |       |

- Molecule 14 is a RNA chain called U6 snRNA.

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 14  | 6A    | 60       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 1273  | 568 | 235 | 410 | 60 |         |       |

- Molecule 15 is a protein called U6 snRNA-associated Sm-like protein LSm2.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 15  | 6a    | 90       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 360   | 180 | 90 | 90 |         |       |

- Molecule 16 is a protein called U6 snRNA-associated Sm-like protein LSm3.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 16  | 6b    | 74       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 296   | 148 | 74 | 74 |         |       |

- Molecule 17 is a protein called U6 snRNA-associated Sm-like protein LSm4.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 17  | 6c    | 74       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 296   | 148 | 74 | 74 |         |       |

- Molecule 18 is a protein called U6 snRNA-associated Sm-like protein LSm5.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 18  | 6d    | 72       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 288   | 144 | 72 | 72 |         |       |

- Molecule 19 is a protein called U6 snRNA-associated Sm-like protein LSm6.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 19  | 6e    | 70       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 280   | 140 | 70 | 70 |         |       |

- Molecule 20 is a protein called U6 snRNA-associated Sm-like protein LSm7.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 20  | 6f    | 65       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 260   | 130 | 65 | 65 |         |       |

- Molecule 21 is a protein called U6 snRNA-associated Sm-like protein LSm8.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 21  | 6g    | 61       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 244   | 122 | 61 | 61 |         |       |

- Molecule 22 is a RNA chain called U4 snRNA.

| Mol | Chain | Residues | Atoms |      |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
| 22  | 4A    | 129      | Total | C    | N   | O   | P   | 0       | 0     |
|     |       |          | 2744  | 1225 | 472 | 917 | 130 |         |       |

- Molecule 23 is a protein called U4/U6 small nuclear ribonucleoprotein Prp3.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 23  | 4B    | 256      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2076  | 1316 | 385 | 367 | 8 |         |       |

- Molecule 24 is a protein called U4/U6 small nuclear ribonucleoprotein Prp4.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 24  | 4C    | 426      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3370  | 2118 | 612 | 620 | 20 |         |       |

- Molecule 25 is a protein called U4/U6 small nuclear ribonucleoprotein Prp31.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 25  | 4D    | 376      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2874  | 1788 | 524 | 550 | 12 |         |       |

- Molecule 26 is a protein called NHP2-like protein 1.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 26  | 4E    | 124      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 962   | 608 | 171 | 178 | 5 |         |       |

- Molecule 27 is a protein called Thioredoxin-like protein 4A.

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 27  | 4F    | 141      | Total | C   | N   | O   | S  | 0       | 0     |
|     |       |          | 1169  | 751 | 194 | 214 | 10 |         |       |

- Molecule 28 is a protein called Pre-mRNA-processing factor 6.

| Mol | Chain | Residues | Atoms |      |      |      |    | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|----|---------|-------|
| 28  | 4G    | 801      | Total | C    | N    | O    | S  | 0       | 0     |
|     |       |          | 5504  | 3419 | 1043 | 1026 | 16 |         |       |

- Molecule 29 is a protein called Peptidyl-prolyl cis-trans isomerase H.

| Mol | Chain | Residues | Atoms |     |     |     |  | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|--|---------|-------|
| 29  | 4H    | 169      | Total | C   | N   | O   |  | 0       | 0     |
|     |       |          | 844   | 506 | 169 | 169 |  |         |       |

- Molecule 30 is a protein called WW domain-binding protein 4.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 30  | 4I    | 75       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 494   | 304 | 96 | 91 | 3 |         |       |

- Molecule 31 is a protein called U4/U6.U5 tri-snRNP-associated protein 1.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 31  | 4J    | 152      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1144  | 709 | 204 | 229 | 2 |         |       |

- Molecule 32 is a protein called Microfibrillar-associated protein 1.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 32  | 4K    | 188      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1192  | 741 | 219 | 230 | 2 |         |       |

- Molecule 33 is a protein called Pre-mRNA-splicing factor 38A.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 33  | 4L    | 175      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1452  | 934 | 244 | 265 | 9 |         |       |

- Molecule 34 is a protein called Ubiquitin-like protein 5.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 34  | 4M    | 73       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 599   | 383 | 103 | 109 | 4 |         |       |

- Molecule 35 is a protein called Zinc finger matrin-type protein 2.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 35  | 4N    | 80       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 640   | 397 | 116 | 120 | 7 |         |       |

- Molecule 36 is a protein called WD40 repeat-containing protein SMU1.

| Mol | Chain | Residues | Atoms |      |     |     |  | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|--|---------|-------|
| 36  | 4Z    | 420      | Total | C    | N   | O   |  | 0       | 0     |
|     |       |          | 2092  | 1252 | 420 | 420 |  |         |       |

- Molecule 37 is a RNA chain called U2 snRNA.

| Mol | Chain | Residues | Atoms |      |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|-----|---------|-------|
| 37  | 2A    | 109      | Total | C    | N   | O   | P   | 0       | 0     |
|     |       |          | 2311  | 1032 | 396 | 774 | 109 |         |       |

- Molecule 38 is a protein called U2 small nuclear ribonucleoprotein A'.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 38  | 2B    | 162      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 648   | 324 | 162 | 162 |         |       |

- Molecule 39 is a protein called U2 small nuclear ribonucleoprotein B'.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 39  | 2C    | 94       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 376   | 188 | 94 | 94 |         |       |

- Molecule 40 is a protein called Splicing factor 3A subunit 1.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 40  | 2D    | 204      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1134  | 644 | 238 | 250 | 2 |         |       |

- Molecule 41 is a protein called Splicing factor 3A subunit 2.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 41  | 2E    | 94       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 376   | 188 | 94 | 94 |         |       |

- Molecule 42 is a protein called Splicing factor 3A subunit 3.

| Mol | Chain | Residues | Atoms |     |     |     | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---------|-------|
| 42  | 2F    | 423      | Total | C   | N   | O   | 0       | 0     |
|     |       |          | 1693  | 847 | 423 | 423 |         |       |

- Molecule 43 is a protein called Splicing factor 3B subunit 1.

| Mol | Chain | Residues | Atoms |      |      |      | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|---------|-------|
| 43  | 2G    | 1048     | Total | C    | N    | O    | 0       | 0     |
|     |       |          | 4192  | 2096 | 1048 | 1048 |         |       |

- Molecule 44 is a protein called Splicing factor 3B subunit 2.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 44  | 2H    | 213      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 959   | 510 | 220 | 226 | 3 |         |       |

- Molecule 45 is a protein called Splicing factor 3B subunit 3.

| Mol | Chain | Residues | Atoms |      |      |      |  | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|--|---------|-------|
| 45  | 2I    | 1168     | Total | C    | N    | O    |  | 0       | 0     |
|     |       |          | 4672  | 2336 | 1168 | 1168 |  |         |       |

- Molecule 46 is a protein called Splicing factor 3B subunit 4.

| Mol | Chain | Residues | Atoms |     |    |    |  | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|--|---------|-------|
| 46  | 2J    | 78       | Total | C   | N  | O  |  | 0       | 0     |
|     |       |          | 312   | 156 | 78 | 78 |  |         |       |

- Molecule 47 is a protein called Splicing factor 3B subunit 6.

| Mol | Chain | Residues | Atoms |     |     |     |  | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|--|---------|-------|
| 47  | 2K    | 108      | Total | C   | N   | O   |  | 0       | 0     |
|     |       |          | 432   | 216 | 108 | 108 |  |         |       |

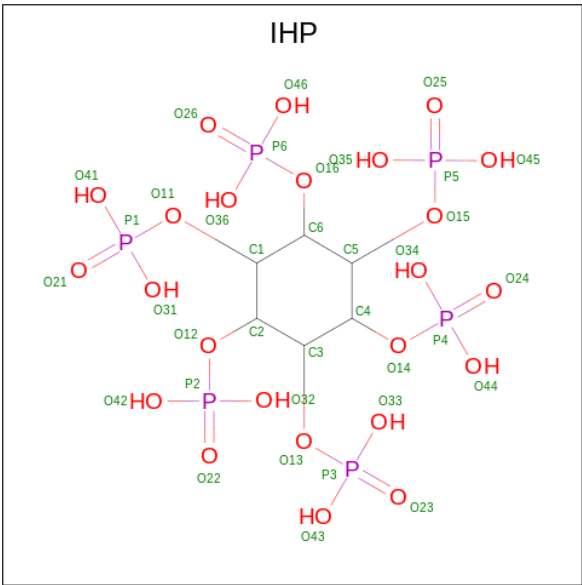
- Molecule 48 is a protein called PHD finger-like domain-containing protein 5A.

| Mol | Chain | Residues | Atoms |     |    |    |  | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|--|---------|-------|
| 48  | 2L    | 89       | Total | C   | N  | O  |  | 0       | 0     |
|     |       |          | 356   | 178 | 89 | 89 |  |         |       |

- Molecule 49 is a protein called Splicing factor 3B subunit 5.

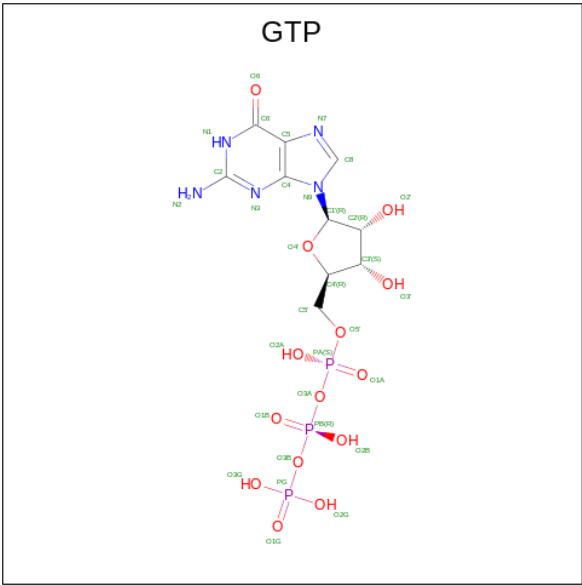
| Mol | Chain | Residues | Atoms |     |    |    |  | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|--|---------|-------|
| 49  | 2M    | 66       | Total | C   | N  | O  |  | 0       | 0     |
|     |       |          | 264   | 132 | 66 | 66 |  |         |       |

- Molecule 50 is INOSITOL HEXAKISPHOSPHATE (CCD ID: IHP) (formula: C<sub>6</sub>H<sub>18</sub>O<sub>24</sub>P<sub>6</sub>).



| Mol | Chain | Residues | Atoms |   |    |   | AltConf |
|-----|-------|----------|-------|---|----|---|---------|
| 50  | 5B    | 1        | Total | C | O  | P | 0       |
|     |       |          | 36    | 6 | 24 | 6 |         |

- Molecule 51 is GUANOSINE-5'-TRIPHOSPHATE (CCD ID: GTP) (formula:  $C_{10}H_{16}N_5O_{14}P_3$ ).



| Mol | Chain | Residues | Atoms |    |   |    |   | AltConf |
|-----|-------|----------|-------|----|---|----|---|---------|
| 51  | 5C    | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 32    | 10 | 5 | 14 | 3 |         |

- Molecule 52 is MAGNESIUM ION (CCD ID: MG) (formula:  $Mg$ ).

| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 52  | 5C    | 1        | Total | Mg | 0       |
|     |       |          | 1     | 1  |         |

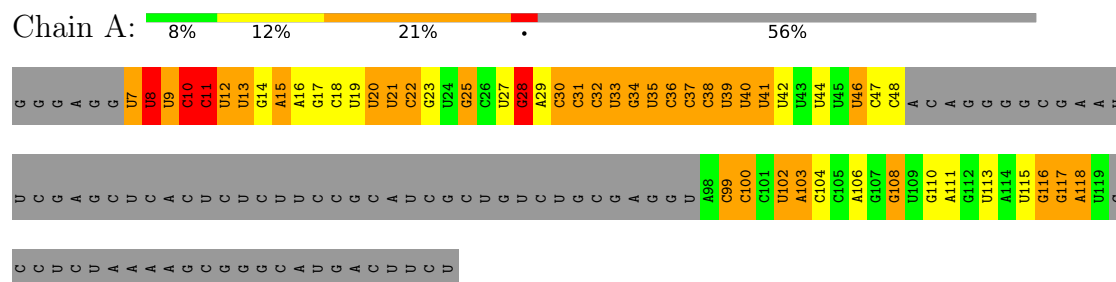
- Molecule 53 is ZINC ION (CCD ID: ZN) (formula: Zn).

| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 53  | 4I    | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |
| 53  | 4N    | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |

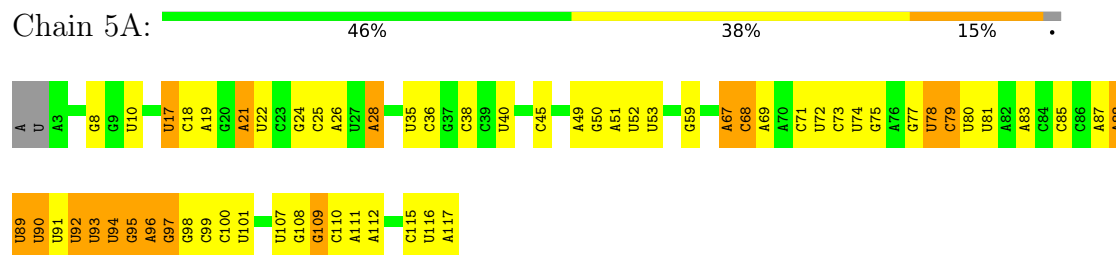
### 3 Residue-property plots

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

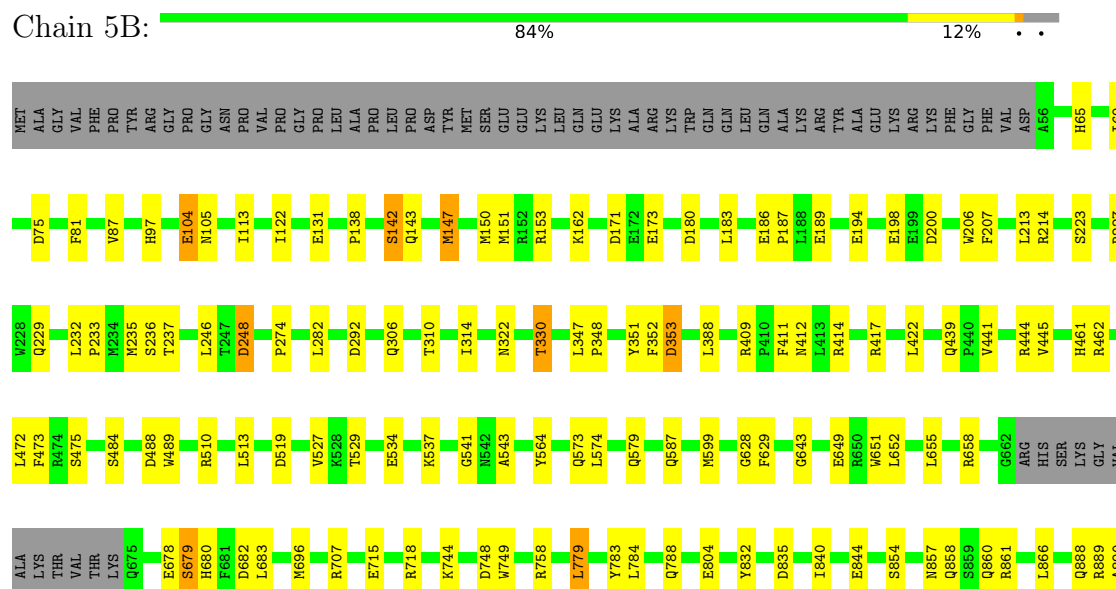
#### • Molecule 1: pre-mRNA



#### • Molecule 2: U5 snRNA



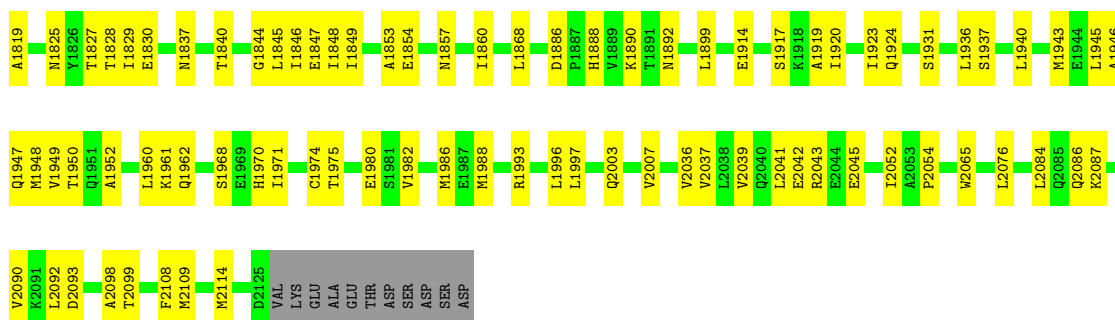
#### • Molecule 3: Pre-mRNA-processing-splicing factor 8



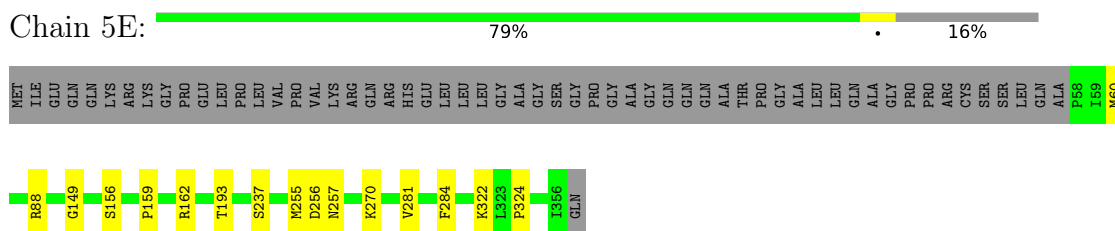


| Category | Percentage |
|----------|------------|
| Very bad | 61%        |
| Bad      | 18%        |
| Good     | 21%        |

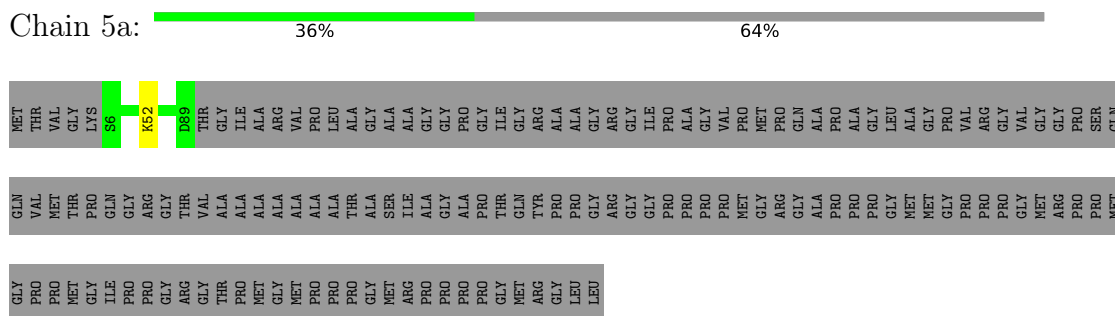




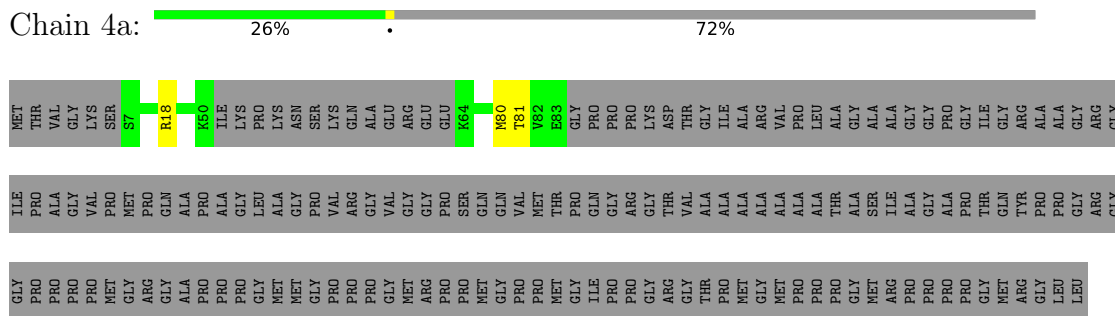
- Molecule 6: U5 small nuclear ribonucleoprotein 40 kDa protein.



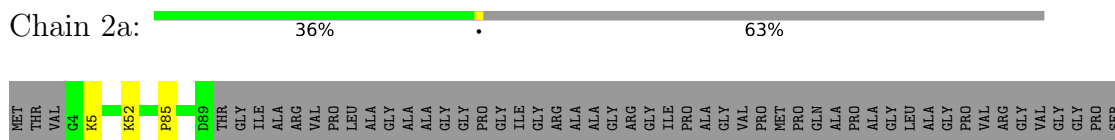
- Molecule 7: Isoform SM-B of Small nuclear ribonucleoprotein-associated proteins B and B'

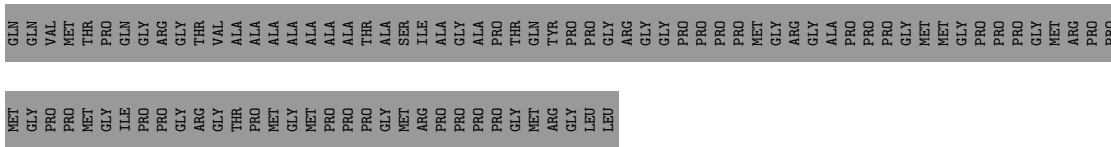


- Molecule 7: Isoform SM-B of Small nuclear ribonucleoprotein-associated proteins B and B'

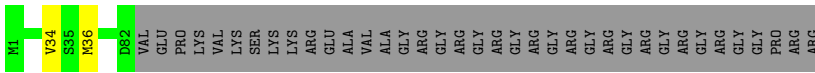


- Molecule 7: Isoform SM-B of Small nuclear ribonucleoprotein-associated proteins B and B'

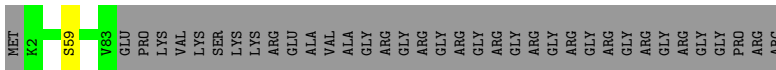




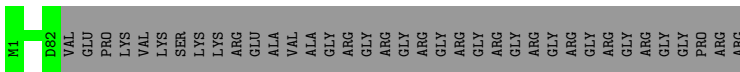
- Molecule 8: Small nuclear ribonucleoprotein Sm D1



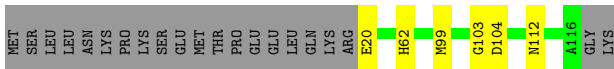
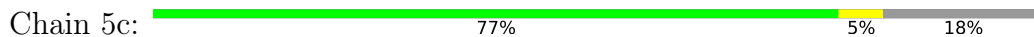
- Molecule 8: Small nuclear ribonucleoprotein Sm D1



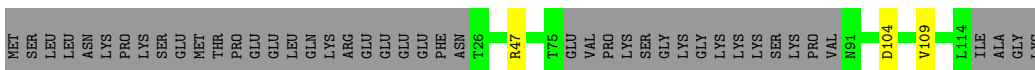
- Molecule 8: Small nuclear ribonucleoprotein Sm D1



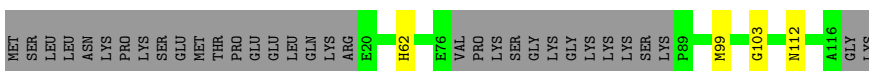
- Molecule 9: Small nuclear ribonucleoprotein Sm D2



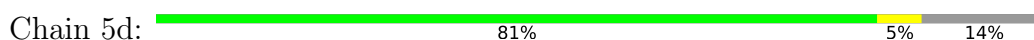
- Molecule 9: Small nuclear ribonucleoprotein Sm D2

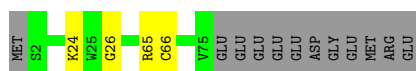


- Molecule 9: Small nuclear ribonucleoprotein Sm D2



- Molecule 10: Small nuclear ribonucleoprotein F





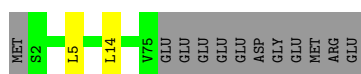
- Molecule 10: Small nuclear ribonucleoprotein F

Chain 4d: 79% 17%



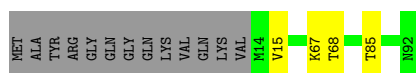
- Molecule 10: Small nuclear ribonucleoprotein F

Chain 2d: 84% 14%



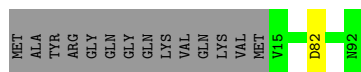
- Molecule 11: Small nuclear ribonucleoprotein E

Chain 5e: 82% 14%



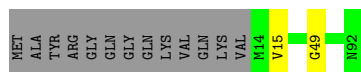
- Molecule 11: Small nuclear ribonucleoprotein E

Chain 4e: 84% 15%



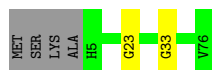
- Molecule 11: Small nuclear ribonucleoprotein E

Chain 2e: 84% 14%



- Molecule 12: Small nuclear ribonucleoprotein G

Chain 5f: 92% 5%

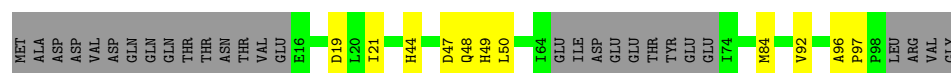


- Molecule 12: Small nuclear ribonucleoprotein G

Chain 4f: 91% 5%

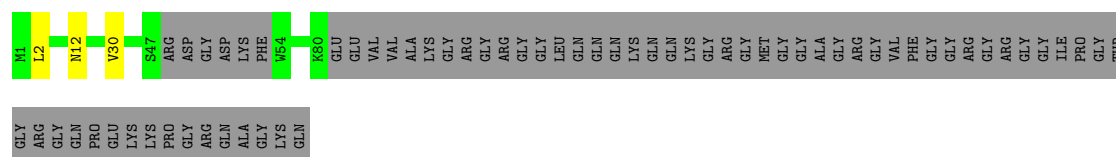


Chain 6b: 



- Molecule 17: U6 snRNA-associated Sm-like protein LSm4

Chain 6c: 



- Molecule 18: U6 snRNA-associated Sm-like protein LSm5

Chain 6d: 



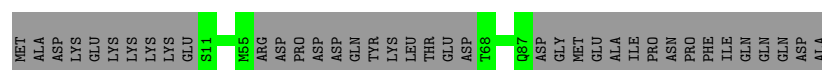
- Molecule 19: U6 snRNA-associated Sm-like protein LSm6

Chain 6e: 



- Molecule 20: U6 snRNA-associated Sm-like protein LSm7

Chain 6f: 



- Molecule 21: U6 snRNA-associated Sm-like protein LSm8

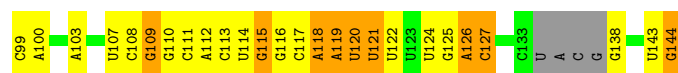
Chain 6g: 



- Molecule 22: U4 snRNA

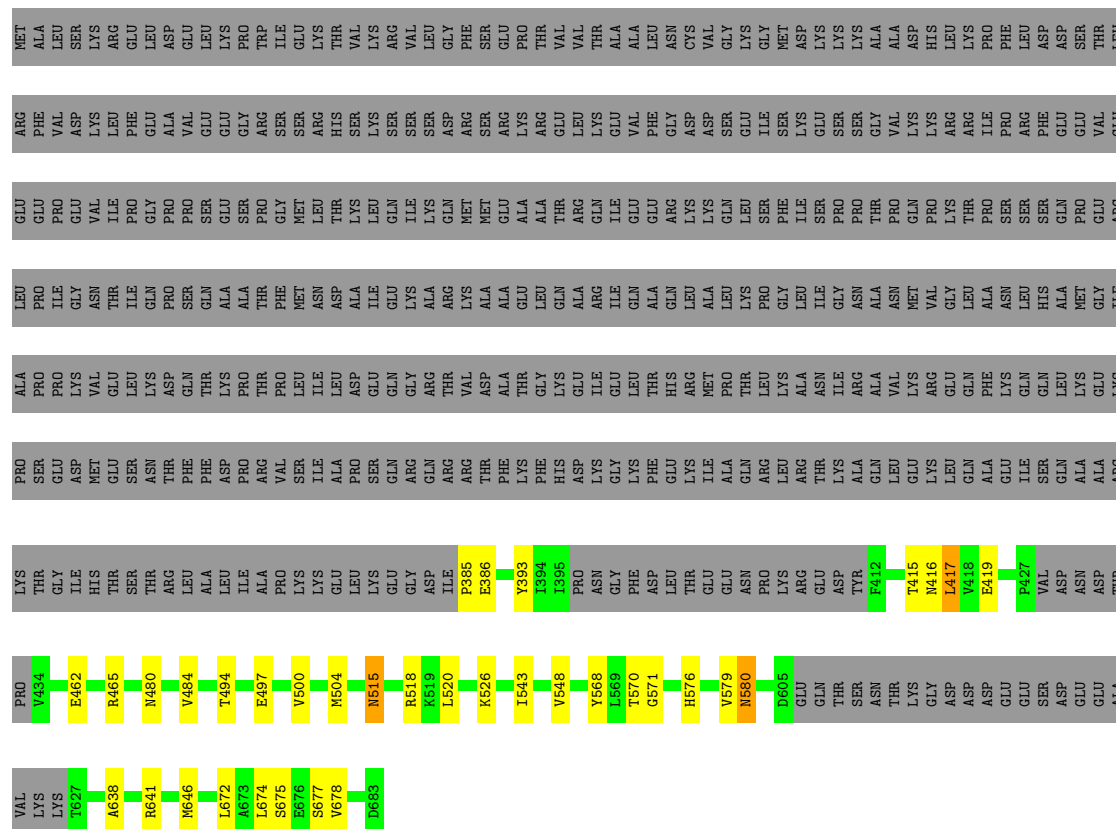
Chain 4A: 





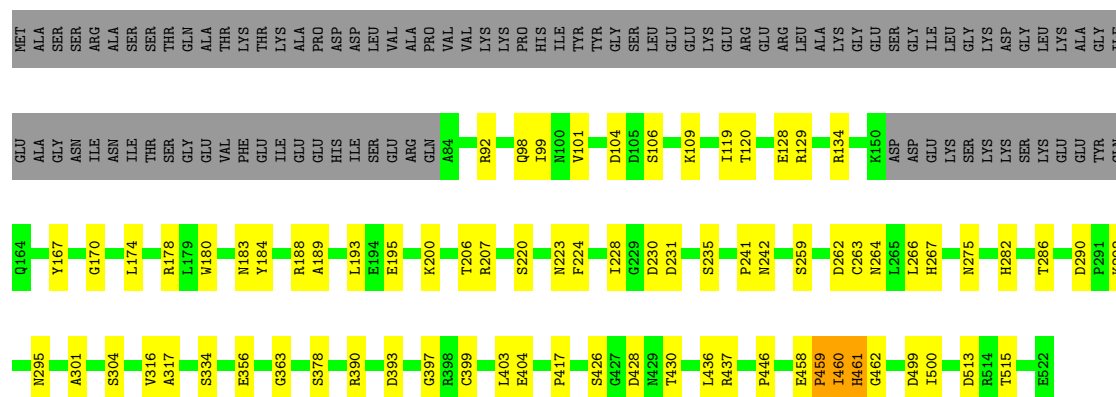
- Molecule 23: U4/U6 small nuclear ribonucleoprotein Prp3

Chain 4B: 32% 5% 63%



- Molecule 24: U4/U6 small nuclear ribonucleoprotein Prp4

Chain 4C: 67% 14% 18%



- Molecule 25: U4/U6 small nuclear ribonucleoprotein Prp31

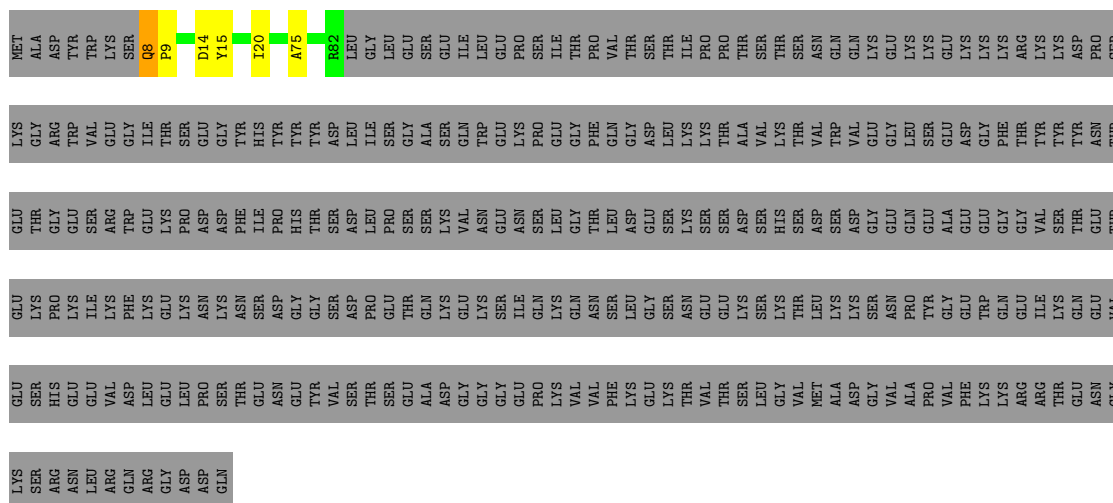
Chain 4D: 67% 8% 25%





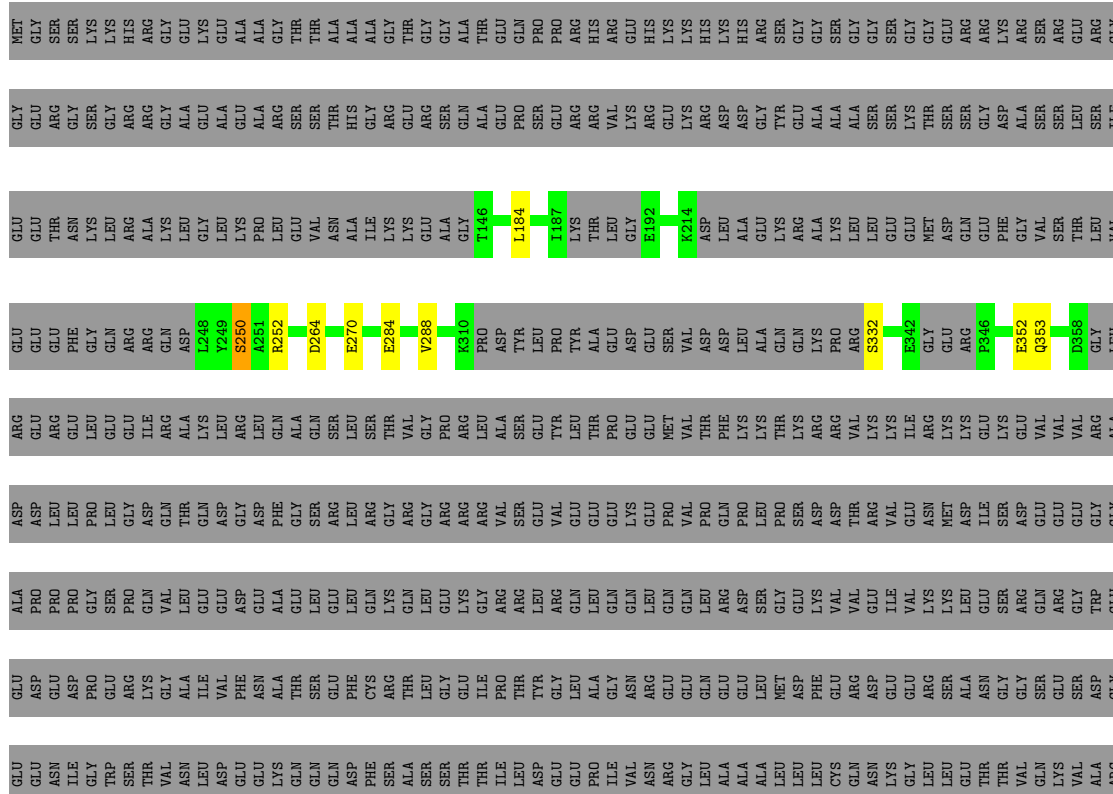
• Molecule 30: WW domain-binding protein 4

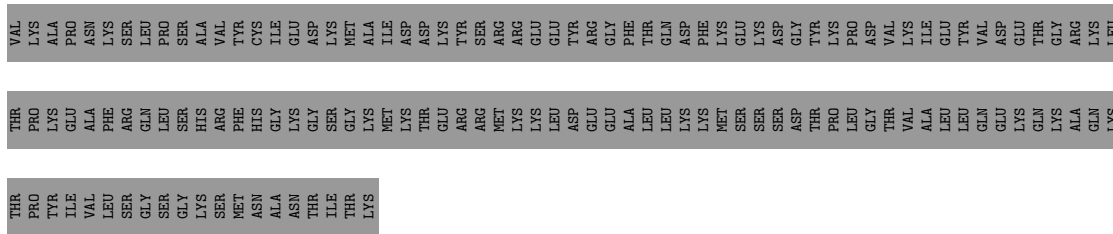
Chain 4I: 18% 80%



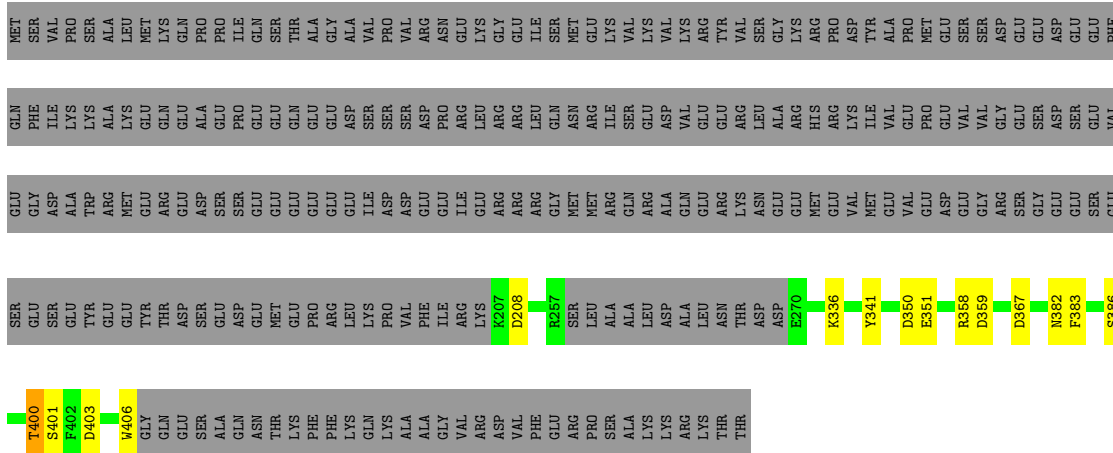
• Molecule 31: U4/U6.U5 tri-snRNP-associated protein 1

Chain 4J: 18% 81%

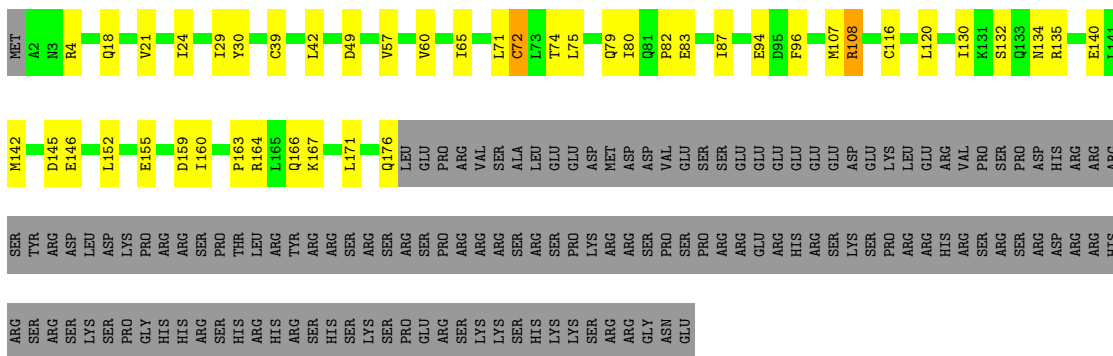




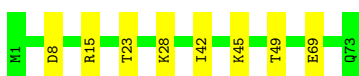
- Molecule 32: Microfibrillar-associated protein 1



- Molecule 33: Pre-mRNA-splicing factor 38A



- Molecule 34: Ubiquitin-like protein 5



- Molecule 35: Zinc finger matrin-type protein 2

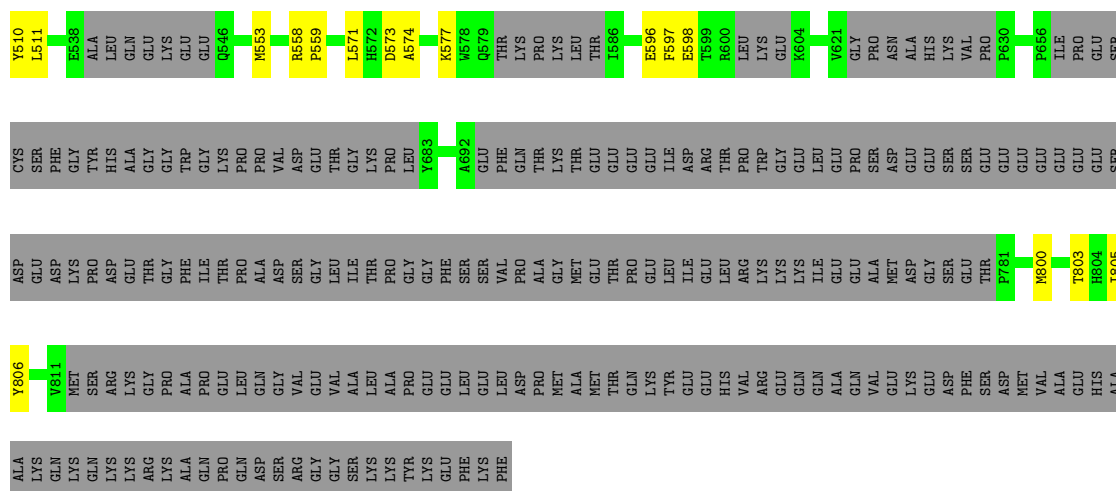






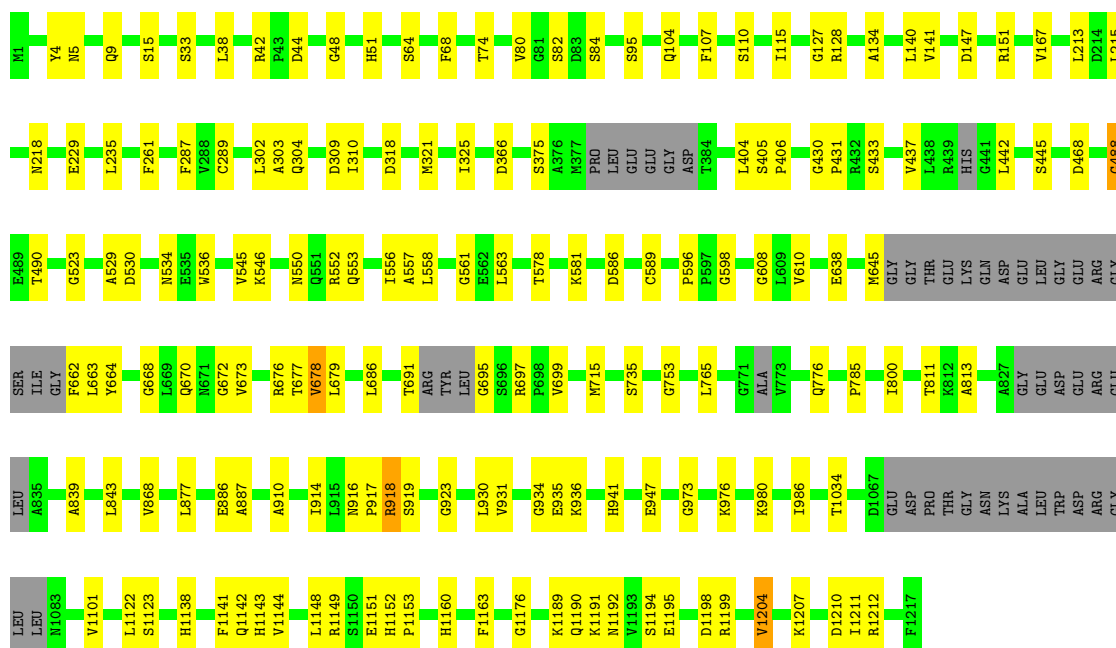






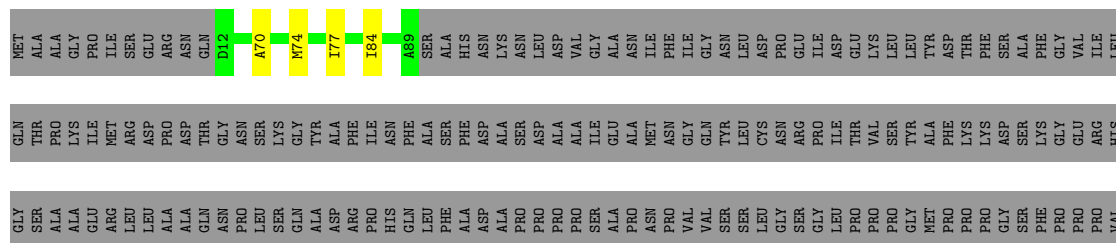
• Molecule 45: Splicing factor 3B subunit 3

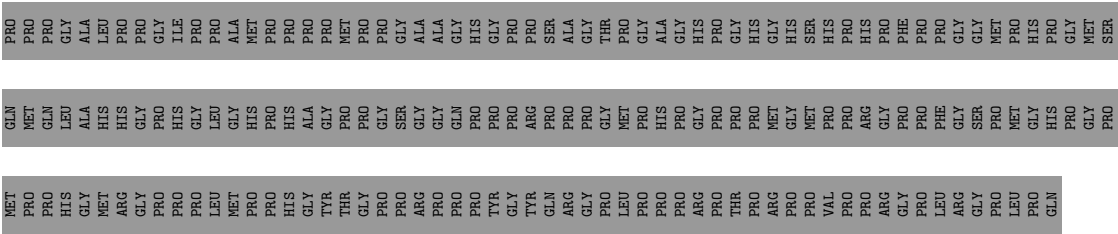
Chain 2I: 83% 13% .



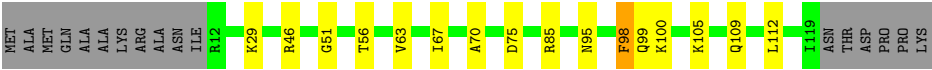
• Molecule 46: Splicing factor 3B subunit 4

Chain 2J: 17% 82% .

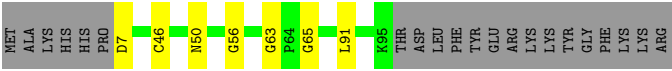




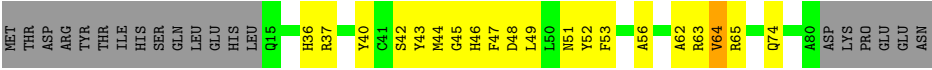
● Molecule 47: Splicing factor 3B subunit 6



● Molecule 48: PHD finger-like domain-containing protein 5A



● Molecule 49: Splicing factor 3B subunit 5



## 4 Experimental information

| Property                             | Value               | Source    |
|--------------------------------------|---------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE     | Depositor |
| Imposed symmetry                     | POINT, Not provided |           |
| Number of particles used             | 414060              | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF   | Depositor |
| CTF correction method                | NONE                | Depositor |
| Microscope                           | FEI TITAN KRIOS     | Depositor |
| Voltage (kV)                         | 300                 | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 50                  | Depositor |
| Minimum defocus (nm)                 | 1000                | Depositor |
| Maximum defocus (nm)                 | 2500                | Depositor |
| Magnification                        | Not provided        |           |
| Image detector                       | GATAN K3 (6k x 4k)  | Depositor |

## 5 Model quality ⓘ

### 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: M7M, IHP, MG, ZN, GTP

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

| Mol | Chain | Bond lengths |               | Bond angles |                |
|-----|-------|--------------|---------------|-------------|----------------|
|     |       | RMSZ         | # Z  >5       | RMSZ        | # Z  >5        |
| 1   | A     | 0.62         | 6/1481 (0.4%) | 0.71        | 2/2297 (0.1%)  |
| 2   | 5A    | 0.24         | 0/2698        | 0.43        | 1/4195 (0.0%)  |
| 3   | 5B    | 0.14         | 0/19154       | 0.32        | 1/26000 (0.0%) |
| 4   | 5C    | 0.14         | 0/6573        | 0.36        | 0/8929         |
| 5   | 5D    | 0.15         | 0/13923       | 0.32        | 2/18868 (0.0%) |
| 6   | 5E    | 1.08         | 0/1195        | 1.21        | 5/1492 (0.3%)  |
| 7   | 2a    | 0.86         | 0/343         | 1.21        | 3/427 (0.7%)   |
| 7   | 4a    | 0.13         | 0/254         | 0.39        | 0/314          |
| 7   | 5a    | 0.85         | 0/335         | 1.18        | 2/417 (0.5%)   |
| 8   | 2b    | 0.89         | 0/327         | 1.11        | 0/407          |
| 8   | 4b    | 0.15         | 0/333         | 0.46        | 0/416          |
| 8   | 5b    | 0.89         | 0/327         | 1.11        | 0/407          |
| 9   | 2c    | 1.18         | 0/338         | 1.20        | 1/419 (0.2%)   |
| 9   | 4c    | 0.16         | 0/298         | 0.49        | 0/370          |
| 9   | 5c    | 1.14         | 0/387         | 1.21        | 1/482 (0.2%)   |
| 10  | 2d    | 1.24         | 1/295 (0.3%)  | 1.26        | 0/367          |
| 10  | 4d    | 0.21         | 0/291         | 0.47        | 0/363          |
| 10  | 5d    | 1.23         | 0/295         | 1.26        | 0/367          |
| 11  | 2e    | 1.02         | 0/315         | 1.26        | 0/392          |
| 11  | 4e    | 0.17         | 0/313         | 0.47        | 0/390          |
| 11  | 5e    | 1.03         | 0/315         | 1.27        | 1/392 (0.3%)   |
| 12  | 2f    | 0.86         | 0/270         | 1.05        | 0/334          |
| 12  | 4f    | 0.24         | 0/297         | 0.59        | 0/371          |
| 12  | 5f    | 0.85         | 0/287         | 1.03        | 0/357          |
| 13  | 2g    | 0.81         | 0/318         | 1.01        | 0/394          |
| 13  | 4g    | 0.14         | 0/287         | 0.35        | 0/358          |
| 13  | 5g    | 0.78         | 0/307         | 1.01        | 0/382          |
| 14  | 6A    | 0.14         | 0/1423        | 0.29        | 0/2211         |
| 15  | 6a    | 0.69         | 0/359         | 1.28        | 0/447          |
| 16  | 6b    | 0.75         | 0/294         | 1.37        | 3/364 (0.8%)   |
| 17  | 6c    | 0.58         | 0/294         | 1.32        | 3/364 (0.8%)   |
| 18  | 6d    | 0.71         | 0/286         | 1.28        | 2/354 (0.6%)   |

| Mol | Chain | Bond lengths |                  | Bond angles |                   |
|-----|-------|--------------|------------------|-------------|-------------------|
|     |       | RMSZ         | # Z  >5          | RMSZ        | # Z  >5           |
| 19  | 6e    | 0.71         | 0/279            | 1.40        | 2/347 (0.6%)      |
| 20  | 6f    | 0.60         | 0/258            | 1.14        | 0/319             |
| 21  | 6g    | 0.67         | 0/242            | 1.21        | 1/299 (0.3%)      |
| 22  | 4A    | 0.19         | 0/3025           | 0.36        | 0/4702            |
| 23  | 4B    | 0.12         | 0/2114           | 0.32        | 0/2836            |
| 24  | 4C    | 0.14         | 0/3452           | 0.33        | 0/4675            |
| 25  | 4D    | 0.12         | 0/2912           | 0.29        | 0/3924            |
| 26  | 4E    | 0.10         | 0/974            | 0.27        | 0/1316            |
| 27  | 4F    | 0.24         | 0/1198           | 0.47        | 2/1620 (0.1%)     |
| 28  | 4G    | 0.11         | 0/5592           | 0.33        | 2/7615 (0.0%)     |
| 29  | 4H    | 0.17         | 0/853            | 0.33        | 0/1188            |
| 30  | 4I    | 0.13         | 0/502            | 0.27        | 0/683             |
| 31  | 4J    | 0.11         | 0/1149           | 0.29        | 0/1542            |
| 32  | 4K    | 0.13         | 0/1209           | 0.30        | 0/1655            |
| 33  | 4L    | 0.14         | 0/1481           | 0.39        | 0/1995            |
| 34  | 4M    | 0.10         | 0/609            | 0.30        | 0/819             |
| 35  | 4N    | 0.17         | 0/646            | 0.37        | 0/859             |
| 36  | 4Z    | 0.17         | 0/2100           | 0.48        | 1/2926 (0.0%)     |
| 37  | 2A    | 0.71         | 12/2576 (0.5%)   | 1.11        | 27/4003 (0.7%)    |
| 38  | 2B    | 0.99         | 0/647            | 2.34        | 33/807 (4.1%)     |
| 39  | 2C    | 0.97         | 0/375            | 1.97        | 7/467 (1.5%)      |
| 40  | 2D    | 0.26         | 0/1139           | 0.68        | 2/1477 (0.1%)     |
| 41  | 2E    | 0.38         | 0/373            | 1.77        | 4/461 (0.9%)      |
| 42  | 2F    | 0.38         | 0/1688           | 0.92        | 3/2102 (0.1%)     |
| 43  | 2G    | 1.72         | 38/4184 (0.9%)   | 1.43        | 27/5216 (0.5%)    |
| 44  | 2H    | 1.02         | 0/957            | 1.08        | 2/1209 (0.2%)     |
| 45  | 2I    | 1.39         | 25/4664 (0.5%)   | 1.20        | 9/5816 (0.2%)     |
| 46  | 2J    | 1.02         | 0/311            | 0.99        | 0/387             |
| 47  | 2K    | 1.27         | 2/431 (0.5%)     | 1.27        | 1/537 (0.2%)      |
| 48  | 2L    | 1.16         | 0/355            | 1.11        | 0/442             |
| 49  | 2M    | 1.59         | 1/263 (0.4%)     | 1.23        | 0/327             |
| All | All   | 0.60         | 85/100770 (0.1%) | 0.69        | 150/136218 (0.1%) |

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 3   | 5B    | 0                   | 1                   |
| 9   | 2c    | 0                   | 1                   |
| 9   | 5c    | 0                   | 1                   |

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| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 42  | 2F    | 0                   | 1                   |
| 43  | 2G    | 0                   | 11                  |
| 44  | 2H    | 0                   | 3                   |
| 45  | 2I    | 0                   | 11                  |
| 47  | 2K    | 0                   | 1                   |
| 49  | 2M    | 0                   | 1                   |
| All | All   | 0                   | 31                  |

All (85) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms  | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|--------|-------|-------------|----------|
| 43  | 2G    | 407  | MET  | N-CA   | 22.52 | 1.71        | 1.46     |
| 43  | 2G    | 406  | ALA  | C-N    | 14.95 | 1.52        | 1.33     |
| 43  | 2G    | 1243 | PRO  | N-CA   | -9.49 | 1.35        | 1.47     |
| 43  | 2G    | 944  | SER  | N-CA   | -8.41 | 1.34        | 1.46     |
| 45  | 2I    | 84   | SER  | CA-C   | -7.80 | 1.42        | 1.53     |
| 37  | 2A    | 142  | C    | C1'-N1 | 7.52  | 1.59        | 1.48     |
| 45  | 2I    | 1101 | VAL  | CA-C   | -7.22 | 1.44        | 1.52     |
| 43  | 2G    | 868  | VAL  | CA-C   | -7.20 | 1.42        | 1.52     |
| 45  | 2I    | 110  | SER  | C-O    | -7.20 | 1.15        | 1.23     |
| 45  | 2I    | 82   | SER  | CA-C   | -7.15 | 1.44        | 1.52     |
| 37  | 2A    | 182  | U    | C1'-N1 | 7.14  | 1.59        | 1.48     |
| 45  | 2I    | 1101 | VAL  | C-O    | -7.00 | 1.16        | 1.24     |
| 37  | 2A    | 150  | U    | C1'-N1 | 6.94  | 1.58        | 1.48     |
| 37  | 2A    | 151  | C    | C1'-N1 | 6.73  | 1.58        | 1.48     |
| 37  | 2A    | 97   | G    | C1'-N9 | -6.71 | 1.37        | 1.48     |
| 43  | 2G    | 1273 | TYR  | CA-C   | -6.71 | 1.43        | 1.52     |
| 37  | 2A    | 141  | C    | C1'-N1 | 6.58  | 1.58        | 1.48     |
| 43  | 2G    | 939  | ARG  | CA-C   | -6.58 | 1.44        | 1.52     |
| 45  | 2I    | 289  | CYS  | C-O    | -6.57 | 1.15        | 1.23     |
| 37  | 2A    | 184  | C    | C1'-N1 | 6.55  | 1.58        | 1.48     |
| 45  | 2I    | 141  | VAL  | C-O    | -6.53 | 1.17        | 1.24     |
| 37  | 2A    | 148  | C    | C1'-N1 | 6.53  | 1.58        | 1.48     |
| 45  | 2I    | 64   | SER  | N-CA   | -6.51 | 1.38        | 1.46     |
| 47  | 2K    | 98   | PHE  | N-CA   | -6.49 | 1.37        | 1.46     |
| 43  | 2G    | 814  | PHE  | CA-C   | -6.20 | 1.45        | 1.52     |
| 43  | 2G    | 678  | ALA  | N-CA   | -6.05 | 1.38        | 1.46     |
| 45  | 2I    | 64   | SER  | C-O    | -6.03 | 1.16        | 1.23     |
| 1   | A     | 9    | U    | C1'-N1 | 6.01  | 1.56        | 1.47     |
| 1   | A     | 8    | U    | C1'-N1 | 6.00  | 1.56        | 1.47     |
| 45  | 2I    | 213  | LEU  | CA-C   | -6.00 | 1.45        | 1.52     |
| 1   | A     | 7    | U    | C1'-N1 | 6.00  | 1.56        | 1.47     |

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| Mol | Chain | Res  | Type | Atoms  | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|--------|-------|-------------|----------|
| 45  | 2I    | 302  | LEU  | C-O    | -5.97 | 1.16        | 1.24     |
| 43  | 2G    | 945  | ALA  | CA-C   | -5.97 | 1.44        | 1.52     |
| 43  | 2G    | 571  | VAL  | CA-C   | -5.92 | 1.45        | 1.52     |
| 45  | 2I    | 115  | ILE  | N-CA   | -5.91 | 1.40        | 1.46     |
| 45  | 2I    | 167  | VAL  | CA-C   | -5.89 | 1.46        | 1.52     |
| 43  | 2G    | 1167 | TYR  | CA-C   | -5.89 | 1.45        | 1.52     |
| 45  | 2I    | 140  | LEU  | CA-C   | -5.87 | 1.45        | 1.52     |
| 43  | 2G    | 893  | ILE  | N-CA   | -5.85 | 1.39        | 1.46     |
| 37  | 2A    | 48   | A    | C1'-N9 | -5.84 | 1.39        | 1.48     |
| 43  | 2G    | 940  | LEU  | CA-C   | -5.81 | 1.45        | 1.52     |
| 37  | 2A    | 65   | U    | C1'-N1 | 5.74  | 1.57        | 1.48     |
| 43  | 2G    | 989  | VAL  | CA-C   | -5.68 | 1.45        | 1.52     |
| 45  | 2I    | 1153 | PRO  | C-O    | -5.67 | 1.18        | 1.24     |
| 43  | 2G    | 233  | ASP  | CA-C   | -5.66 | 1.45        | 1.52     |
| 45  | 2I    | 104  | GLN  | CA-C   | -5.66 | 1.46        | 1.52     |
| 45  | 2I    | 235  | LEU  | C-O    | -5.66 | 1.16        | 1.23     |
| 43  | 2G    | 482  | VAL  | C-O    | -5.64 | 1.17        | 1.24     |
| 43  | 2G    | 1177 | LEU  | C-O    | -5.64 | 1.17        | 1.24     |
| 47  | 2K    | 95   | ASN  | N-CA   | -5.64 | 1.39        | 1.46     |
| 43  | 2G    | 838  | VAL  | N-CA   | -5.59 | 1.40        | 1.46     |
| 45  | 2I    | 80   | VAL  | C-O    | -5.55 | 1.18        | 1.24     |
| 43  | 2G    | 235  | THR  | C-O    | -5.53 | 1.19        | 1.24     |
| 1   | A     | 11   | C    | C1'-N1 | 5.50  | 1.55        | 1.47     |
| 45  | 2I    | 1123 | SER  | CA-C   | -5.50 | 1.45        | 1.52     |
| 37  | 2A    | 110  | A    | C1'-N9 | -5.47 | 1.39        | 1.48     |
| 45  | 2I    | 134  | ALA  | C-O    | -5.45 | 1.18        | 1.23     |
| 1   | A     | 10   | C    | C1'-N1 | 5.45  | 1.55        | 1.47     |
| 45  | 2I    | 107  | PHE  | CA-C   | -5.44 | 1.45        | 1.52     |
| 43  | 2G    | 439  | GLY  | CA-C   | 5.42  | 1.56        | 1.52     |
| 43  | 2G    | 738  | HIS  | N-CA   | -5.41 | 1.39        | 1.45     |
| 45  | 2I    | 941  | HIS  | C-O    | 5.34  | 1.30        | 1.23     |
| 43  | 2G    | 627  | THR  | N-CA   | -5.33 | 1.40        | 1.46     |
| 45  | 2I    | 38   | LEU  | CA-C   | -5.32 | 1.46        | 1.52     |
| 1   | A     | 46   | U    | C1'-N1 | 5.29  | 1.55        | 1.47     |
| 43  | 2G    | 680  | LEU  | C-O    | -5.28 | 1.19        | 1.24     |
| 43  | 2G    | 721  | ILE  | N-CA   | -5.25 | 1.40        | 1.46     |
| 43  | 2G    | 864  | TYR  | CA-C   | -5.23 | 1.46        | 1.52     |
| 45  | 2I    | 1034 | THR  | CA-C   | -5.20 | 1.47        | 1.53     |
| 43  | 2G    | 898  | TYR  | C-N    | -5.18 | 1.27        | 1.33     |
| 43  | 2G    | 415  | LEU  | C-N    | 5.18  | 1.39        | 1.33     |
| 43  | 2G    | 672  | ALA  | CA-C   | -5.17 | 1.46        | 1.52     |
| 43  | 2G    | 776  | GLU  | CA-C   | -5.16 | 1.45        | 1.52     |

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| Mol | Chain | Res  | Type | Atoms  | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|--------|-------|-------------|----------|
| 43  | 2G    | 407  | MET  | C-O    | -5.16 | 1.18        | 1.23     |
| 49  | 2M    | 44   | MET  | C-O    | -5.15 | 1.18        | 1.24     |
| 43  | 2G    | 601  | ALA  | N-CA   | -5.14 | 1.40        | 1.46     |
| 37  | 2A    | 60   | U    | C1'-N1 | 5.12  | 1.56        | 1.48     |
| 43  | 2G    | 1279 | ALA  | CA-C   | -5.12 | 1.46        | 1.52     |
| 43  | 2G    | 1281 | ILE  | CA-C   | -5.12 | 1.46        | 1.52     |
| 43  | 2G    | 944  | SER  | CA-C   | 5.09  | 1.59        | 1.53     |
| 43  | 2G    | 899  | ALA  | N-CA   | -5.09 | 1.40        | 1.46     |
| 10  | 2d    | 14   | LEU  | CA-C   | 5.07  | 1.59        | 1.52     |
| 45  | 2I    | 68   | PHE  | N-CA   | -5.05 | 1.40        | 1.46     |
| 43  | 2G    | 739  | ARG  | N-CA   | -5.03 | 1.40        | 1.46     |
| 43  | 2G    | 1253 | GLY  | N-CA   | -5.03 | 1.39        | 1.45     |

All (150) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms     | Z      | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|--------|-------------|----------|
| 41  | 2E    | 146 | MET  | CA-C-N    | 21.07  | 146.17      | 119.84   |
| 41  | 2E    | 146 | MET  | C-N-CA    | 21.07  | 146.17      | 119.84   |
| 43  | 2G    | 406 | ALA  | CA-C-N    | 17.67  | 147.39      | 120.89   |
| 43  | 2G    | 406 | ALA  | C-N-CA    | 17.67  | 147.39      | 120.89   |
| 43  | 2G    | 406 | ALA  | CA-C-O    | -13.04 | 105.77      | 120.24   |
| 43  | 2G    | 108 | ARG  | CA-C-N    | 12.13  | 132.88      | 120.38   |
| 43  | 2G    | 108 | ARG  | C-N-CA    | 12.13  | 132.88      | 120.38   |
| 45  | 2I    | 916 | ASN  | CA-C-N    | 9.51   | 131.72      | 119.84   |
| 45  | 2I    | 916 | ASN  | C-N-CA    | 9.51   | 131.72      | 119.84   |
| 43  | 2G    | 114 | ASP  | N-CA-C    | 9.45   | 121.35      | 111.14   |
| 37  | 2A    | 180 | G    | O3'-P-O5' | -8.65  | 91.02       | 104.00   |
| 37  | 2A    | 149 | A    | O3'-P-O5' | -8.65  | 91.03       | 104.00   |
| 37  | 2A    | 182 | U    | O3'-P-O5' | -8.62  | 91.06       | 104.00   |
| 37  | 2A    | 183 | G    | O3'-P-O5' | -8.59  | 91.11       | 104.00   |
| 37  | 2A    | 148 | C    | O3'-P-O5' | -8.59  | 91.12       | 104.00   |
| 37  | 2A    | 141 | C    | O3'-P-O5' | -8.57  | 91.14       | 104.00   |
| 37  | 2A    | 150 | U    | O3'-P-O5' | -8.55  | 91.17       | 104.00   |
| 37  | 2A    | 113 | G    | O3'-P-O5' | -8.54  | 91.19       | 104.00   |
| 37  | 2A    | 181 | G    | O3'-P-O5' | -8.54  | 91.19       | 104.00   |
| 19  | 6e    | 45  | LEU  | N-CA-C    | 8.53   | 123.56      | 112.12   |
| 37  | 2A    | 114 | A    | O3'-P-O5' | -8.53  | 91.21       | 104.00   |
| 28  | 4G    | 707 | ASP  | CA-C-N    | 8.18   | 136.43      | 121.70   |
| 28  | 4G    | 707 | ASP  | C-N-CA    | 8.18   | 136.43      | 121.70   |
| 38  | 2B    | 16  | THR  | CA-C-O    | -8.01  | 111.79      | 120.36   |
| 38  | 2B    | 99  | SER  | N-CA-C    | 8.01   | 122.84      | 112.26   |
| 5   | 5D    | 583 | THR  | CA-C-N    | 7.79   | 136.07      | 121.81   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 5   | 5D    | 583  | THR  | C-N-CA      | 7.79  | 136.07      | 121.81   |
| 38  | 2B    | 117  | TYR  | CA-C-O      | 7.76  | 128.55      | 120.40   |
| 37  | 2A    | 168  | A    | P-O5'-C5'   | -7.62 | 109.47      | 120.90   |
| 36  | 4Z    | 380  | THR  | N-CA-C      | 7.36  | 121.68      | 111.74   |
| 37  | 2A    | 167  | U    | O3'-P-O5'   | -7.27 | 93.09       | 104.00   |
| 38  | 2B    | 71   | VAL  | CA-C-N      | 7.19  | 131.60      | 120.75   |
| 38  | 2B    | 71   | VAL  | C-N-CA      | 7.19  | 131.60      | 120.75   |
| 43  | 2G    | 613  | MET  | N-CA-C      | 7.18  | 121.75      | 112.92   |
| 43  | 2G    | 1100 | ASN  | N-CA-C      | 7.16  | 119.22      | 110.41   |
| 43  | 2G    | 407  | MET  | N-CA-C      | 7.05  | 121.96      | 111.04   |
| 37  | 2A    | 170  | C    | C3'-C2'-O2' | -7.02 | 104.07      | 114.60   |
| 3   | 5B    | 1194 | CYS  | CA-CB-SG    | 6.94  | 130.36      | 114.40   |
| 40  | 2D    | 199  | ARG  | CA-C-N      | 6.91  | 127.87      | 120.47   |
| 40  | 2D    | 199  | ARG  | C-N-CA      | 6.91  | 127.87      | 120.47   |
| 42  | 2F    | 290  | GLY  | N-CA-C      | 6.88  | 120.98      | 112.73   |
| 38  | 2B    | 121  | LEU  | CA-C-O      | 6.87  | 128.85      | 121.44   |
| 38  | 2B    | 4    | LEU  | N-CA-C      | -6.85 | 98.05       | 108.67   |
| 39  | 2C    | 53   | PHE  | CA-C-O      | -6.83 | 112.80      | 120.32   |
| 41  | 2E    | 158  | ARG  | N-CA-C      | 6.75  | 118.72      | 111.36   |
| 43  | 2G    | 1120 | ALA  | CA-C-N      | -6.69 | 111.34      | 120.44   |
| 43  | 2G    | 1120 | ALA  | C-N-CA      | -6.69 | 111.34      | 120.44   |
| 37  | 2A    | 164  | C    | C5'-C4'-O4' | -6.57 | 99.25       | 109.10   |
| 47  | 2K    | 85   | ARG  | N-CA-C      | 6.52  | 120.03      | 109.40   |
| 38  | 2B    | 87   | LEU  | CA-C-N      | 6.41  | 126.17      | 119.05   |
| 38  | 2B    | 87   | LEU  | C-N-CA      | 6.41  | 126.17      | 119.05   |
| 43  | 2G    | 406  | ALA  | O-C-N       | 6.41  | 130.56      | 122.23   |
| 37  | 2A    | 168  | A    | C5'-C4'-C3' | -6.33 | 106.51      | 116.00   |
| 38  | 2B    | 40   | THR  | CA-C-N      | 6.24  | 131.44      | 122.40   |
| 38  | 2B    | 40   | THR  | C-N-CA      | 6.24  | 131.44      | 122.40   |
| 43  | 2G    | 406  | ALA  | N-CA-C      | 6.23  | 119.35      | 111.69   |
| 37  | 2A    | 169  | C    | P-O3'-C3'   | 6.23  | 129.54      | 120.20   |
| 43  | 2G    | 1180 | ARG  | N-CA-C      | -6.16 | 103.27      | 111.96   |
| 38  | 2B    | 73   | ASN  | N-CA-C      | 6.16  | 119.85      | 111.17   |
| 44  | 2H    | 559  | PRO  | N-CA-C      | 6.11  | 120.07      | 111.33   |
| 43  | 2G    | 1275 | GLY  | N-CA-C      | -6.11 | 104.91      | 111.93   |
| 38  | 2B    | 79   | ILE  | CA-C-N      | 6.05  | 125.85      | 120.10   |
| 38  | 2B    | 79   | ILE  | C-N-CA      | 6.05  | 125.85      | 120.10   |
| 43  | 2G    | 415  | LEU  | O-C-N       | -6.02 | 114.40      | 121.32   |
| 2   | 5A    | 77   | G    | P-O3'-C3'   | -5.96 | 111.26      | 120.20   |
| 39  | 2C    | 46   | MET  | N-CA-C      | -5.94 | 104.71      | 111.07   |
| 17  | 6c    | 2    | LEU  | CA-C-N      | 5.87  | 127.17      | 119.84   |
| 17  | 6c    | 2    | LEU  | C-N-CA      | 5.87  | 127.17      | 119.84   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 38  | 2B    | 113  | LYS  | N-CA-C      | 5.85  | 118.41      | 111.33   |
| 37  | 2A    | 163  | G    | O3'-P-O5'   | -5.85 | 95.23       | 104.00   |
| 43  | 2G    | 465  | PRO  | N-CA-C      | -5.84 | 106.51      | 114.80   |
| 38  | 2B    | 50   | SER  | CA-C-O      | 5.83  | 127.73      | 121.55   |
| 18  | 6d    | 13   | LEU  | CA-C-N      | 5.82  | 125.95      | 119.32   |
| 18  | 6d    | 13   | LEU  | C-N-CA      | 5.82  | 125.95      | 119.32   |
| 38  | 2B    | 27   | ARG  | CA-C-N      | 5.74  | 128.78      | 120.11   |
| 38  | 2B    | 27   | ARG  | C-N-CA      | 5.74  | 128.78      | 120.11   |
| 45  | 2I    | 679  | LEU  | N-CA-C      | 5.73  | 119.43      | 110.32   |
| 19  | 6e    | 63   | ALA  | N-CA-C      | 5.71  | 118.08      | 109.23   |
| 37  | 2A    | 164  | C    | P-O3'-C3'   | 5.70  | 128.75      | 120.20   |
| 45  | 2I    | 887  | ALA  | N-CA-C      | -5.68 | 101.64      | 110.10   |
| 43  | 2G    | 942  | ASN  | CA-C-N      | -5.64 | 114.77      | 124.82   |
| 43  | 2G    | 942  | ASN  | C-N-CA      | -5.64 | 114.77      | 124.82   |
| 7   | 2a    | 52   | LYS  | CA-C-N      | -5.64 | 114.12      | 119.76   |
| 7   | 2a    | 52   | LYS  | C-N-CA      | -5.64 | 114.12      | 119.76   |
| 37  | 2A    | 160  | A    | P-O5'-C5'   | -5.62 | 112.46      | 120.90   |
| 38  | 2B    | 71   | VAL  | O-C-N       | -5.62 | 115.54      | 122.57   |
| 43  | 2G    | 942  | ASN  | N-CA-C      | -5.60 | 98.86       | 110.80   |
| 38  | 2B    | 32   | PRO  | CA-C-N      | 5.59  | 130.76      | 122.99   |
| 38  | 2B    | 32   | PRO  | C-N-CA      | 5.59  | 130.76      | 122.99   |
| 7   | 5a    | 52   | LYS  | CA-C-N      | -5.56 | 114.20      | 119.76   |
| 7   | 5a    | 52   | LYS  | C-N-CA      | -5.56 | 114.20      | 119.76   |
| 27  | 4F    | 78   | PRO  | N-CD-CG     | -5.55 | 94.88       | 103.20   |
| 38  | 2B    | 34   | ILE  | CA-C-O      | -5.53 | 114.21      | 120.74   |
| 6   | 5E    | 322  | LYS  | N-CA-C      | -5.52 | 98.20       | 108.02   |
| 37  | 2A    | 168  | A    | O4'-C1'-C2' | -5.50 | 102.10      | 107.60   |
| 6   | 5E    | 284  | PHE  | N-CA-C      | 5.49  | 119.48      | 112.34   |
| 37  | 2A    | 157  | G    | P-O5'-C5'   | -5.49 | 112.66      | 120.90   |
| 37  | 2A    | 165  | A    | N9-C1'-C2'  | 5.49  | 120.23      | 112.00   |
| 38  | 2B    | 159  | GLU  | N-CA-C      | -5.48 | 104.95      | 111.69   |
| 7   | 2a    | 5    | LYS  | N-CA-C      | 5.48  | 118.17      | 111.82   |
| 6   | 5E    | 281  | VAL  | N-CA-C      | 5.46  | 116.17      | 108.36   |
| 38  | 2B    | 16   | THR  | O-C-N       | 5.45  | 129.43      | 123.22   |
| 16  | 6b    | 49   | HIS  | N-CA-C      | -5.45 | 106.71      | 113.19   |
| 43  | 2G    | 1128 | VAL  | N-CA-C      | 5.45  | 117.90      | 111.09   |
| 44  | 2H    | 511  | LEU  | N-CA-C      | 5.44  | 117.53      | 108.99   |
| 43  | 2G    | 1105 | GLU  | N-CA-C      | 5.43  | 117.58      | 108.73   |
| 45  | 2I    | 488  | GLY  | N-CA-C      | -5.42 | 106.37      | 115.80   |
| 1   | A     | 28   | G    | C4'-C3'-O3' | -5.41 | 104.88      | 113.00   |
| 1   | A     | 28   | G    | C2'-C3'-O3' | -5.41 | 105.59      | 113.70   |
| 38  | 2B    | 40   | THR  | N-CA-C      | -5.39 | 106.20      | 112.89   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 6   | 5E    | 156  | SER  | N-CA-C      | 5.38  | 116.70      | 108.42   |
| 6   | 5E    | 237  | SER  | N-CA-C      | 5.37  | 117.87      | 110.35   |
| 41  | 2E    | 199  | TRP  | N-CA-C      | 5.35  | 117.36      | 107.73   |
| 38  | 2B    | 125  | VAL  | CA-C-N      | 5.35  | 127.98      | 120.28   |
| 38  | 2B    | 125  | VAL  | C-N-CA      | 5.35  | 127.98      | 120.28   |
| 17  | 6c    | 30   | VAL  | N-CA-C      | 5.33  | 116.22      | 111.90   |
| 16  | 6b    | 92   | VAL  | N-CA-C      | 5.32  | 115.95      | 109.30   |
| 43  | 2G    | 1106 | ARG  | N-CA-C      | 5.28  | 118.86      | 111.74   |
| 38  | 2B    | 146  | ASP  | CA-C-N      | 5.26  | 130.03      | 122.40   |
| 38  | 2B    | 146  | ASP  | C-N-CA      | 5.26  | 130.03      | 122.40   |
| 45  | 2I    | 4    | TYR  | N-CA-C      | -5.25 | 102.52      | 110.28   |
| 42  | 2F    | 289  | LYS  | N-CA-C      | 5.24  | 121.96      | 110.80   |
| 21  | 6g    | 69   | VAL  | N-CA-C      | 5.23  | 115.44      | 108.27   |
| 37  | 2A    | 171  | U    | C2'-C3'-O3' | -5.23 | 105.86      | 113.70   |
| 37  | 2A    | 170  | C    | O4'-C1'-C2' | -5.23 | 100.57      | 105.80   |
| 39  | 2C    | 20   | LYS  | N-CA-C      | 5.21  | 117.36      | 111.11   |
| 16  | 6b    | 44   | HIS  | N-CA-C      | -5.18 | 107.02      | 113.55   |
| 43  | 2G    | 415  | LEU  | CA-C-N      | 5.14  | 125.67      | 120.38   |
| 43  | 2G    | 415  | LEU  | C-N-CA      | 5.14  | 125.67      | 120.38   |
| 9   | 5c    | 99   | MET  | N-CA-C      | 5.14  | 116.88      | 108.76   |
| 39  | 2C    | 51   | GLN  | N-CA-C      | 5.13  | 117.48      | 109.52   |
| 37  | 2A    | 155  | C    | P-O3'-C3'   | 5.12  | 127.88      | 120.20   |
| 27  | 4F    | 78   | PRO  | CA-N-CD     | -5.11 | 104.84      | 112.00   |
| 39  | 2C    | 48   | MET  | N-CA-C      | 5.11  | 119.52      | 113.28   |
| 38  | 2B    | 90   | LEU  | O-C-N       | 5.11  | 129.39      | 122.59   |
| 11  | 5e    | 85   | THR  | N-CA-C      | -5.11 | 105.89      | 112.68   |
| 39  | 2C    | 38   | VAL  | O-C-N       | 5.10  | 127.09      | 121.83   |
| 38  | 2B    | 90   | LEU  | CA-C-O      | -5.10 | 113.22      | 120.51   |
| 37  | 2A    | 160  | A    | N9-C1'-C2'  | 5.10  | 119.65      | 112.00   |
| 38  | 2B    | 83   | LEU  | N-CA-C      | 5.09  | 117.50      | 111.33   |
| 9   | 2c    | 99   | MET  | N-CA-C      | 5.09  | 116.80      | 108.76   |
| 37  | 2A    | 156  | U    | C4'-C3'-C2' | 5.08  | 107.69      | 102.60   |
| 39  | 2C    | 83   | TYR  | CA-C-O      | -5.08 | 115.25      | 121.05   |
| 45  | 2I    | 404  | LEU  | N-CA-C      | -5.08 | 105.82      | 111.36   |
| 45  | 2I    | 9    | GLN  | N-CA-C      | -5.07 | 101.49      | 109.25   |
| 38  | 2B    | 81   | GLU  | N-CA-C      | 5.05  | 118.59      | 112.23   |
| 45  | 2I    | 445  | SER  | N-CA-C      | -5.04 | 104.03      | 110.53   |
| 43  | 2G    | 1002 | ASN  | CA-C-N      | -5.02 | 118.05      | 122.97   |
| 43  | 2G    | 1002 | ASN  | C-N-CA      | -5.02 | 118.05      | 122.97   |
| 42  | 2F    | 274  | CYS  | N-CA-C      | 5.01  | 116.56      | 111.14   |

There are no chirality outliers.

All (31) planarity outliers are listed below:

| Mol | Chain | Res  | Type | Group             |
|-----|-------|------|------|-------------------|
| 42  | 2F    | 443  | THR  | Peptide           |
| 43  | 2G    | 1025 | LYS  | Peptide           |
| 43  | 2G    | 1122 | THR  | Peptide           |
| 43  | 2G    | 1127 | THR  | Peptide           |
| 43  | 2G    | 1179 | ASP  | Peptide           |
| 43  | 2G    | 1199 | VAL  | Peptide           |
| 43  | 2G    | 220  | GLN  | Peptide           |
| 43  | 2G    | 415  | LEU  | Mainchain,Peptide |
| 43  | 2G    | 689  | ILE  | Peptide           |
| 43  | 2G    | 941  | ASN  | Peptide           |
| 43  | 2G    | 944  | SER  | Peptide           |
| 44  | 2H    | 553  | MET  | Peptide           |
| 44  | 2H    | 558  | ARG  | Peptide           |
| 44  | 2H    | 571  | LEU  | Peptide           |
| 45  | 2I    | 261  | PHE  | Peptide           |
| 45  | 2I    | 366  | ASP  | Peptide           |
| 45  | 2I    | 468  | ASP  | Peptide           |
| 45  | 2I    | 530  | ASP  | Peptide           |
| 45  | 2I    | 534  | ASN  | Peptide           |
| 45  | 2I    | 552  | ARG  | Peptide           |
| 45  | 2I    | 670  | GLN  | Peptide           |
| 45  | 2I    | 678  | VAL  | Peptide           |
| 45  | 2I    | 74   | THR  | Peptide           |
| 45  | 2I    | 980  | LYS  | Peptide           |
| 45  | 2I    | 986  | ILE  | Peptide           |
| 47  | 2K    | 29   | LYS  | Peptide           |
| 49  | 2M    | 74   | GLN  | Peptide           |
| 9   | 2c    | 112  | ASN  | Peptide           |
| 3   | 5B    | 941  | LYS  | Peptide           |
| 9   | 5c    | 112  | ASN  | Peptide           |

## 5.2 Too-close contacts [i](#)

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | A     | 1334  | 0        | 681      | 160     | 0            |
| 2   | 5A    | 2420  | 0        | 1226     | 82      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 3   | 5B    | 18639 | 0        | 18495    | 192     | 0            |
| 4   | 5C    | 6430  | 0        | 6446     | 114     | 0            |
| 5   | 5D    | 13633 | 0        | 13769    | 315     | 0            |
| 6   | 5E    | 1196  | 0        | 337      | 2       | 0            |
| 7   | 2a    | 344   | 0        | 93       | 4       | 0            |
| 7   | 4a    | 256   | 0        | 70       | 2       | 0            |
| 7   | 5a    | 336   | 0        | 89       | 0       | 0            |
| 8   | 2b    | 328   | 0        | 89       | 0       | 0            |
| 8   | 4b    | 334   | 0        | 92       | 1       | 0            |
| 8   | 5b    | 328   | 0        | 89       | 5       | 0            |
| 9   | 2c    | 340   | 0        | 87       | 1       | 0            |
| 9   | 4c    | 300   | 0        | 80       | 5       | 0            |
| 9   | 5c    | 388   | 0        | 102      | 7       | 0            |
| 10  | 2d    | 296   | 0        | 87       | 1       | 0            |
| 10  | 4d    | 292   | 0        | 93       | 7       | 0            |
| 10  | 5d    | 296   | 0        | 87       | 10      | 0            |
| 11  | 2e    | 316   | 0        | 85       | 2       | 0            |
| 11  | 4e    | 314   | 0        | 86       | 3       | 0            |
| 11  | 5e    | 316   | 0        | 85       | 4       | 0            |
| 12  | 2f    | 272   | 0        | 75       | 1       | 0            |
| 12  | 4f    | 298   | 0        | 89       | 5       | 0            |
| 12  | 5f    | 288   | 0        | 82       | 5       | 0            |
| 13  | 2g    | 320   | 0        | 88       | 0       | 0            |
| 13  | 4g    | 288   | 0        | 84       | 1       | 0            |
| 13  | 5g    | 308   | 0        | 86       | 5       | 0            |
| 14  | 6A    | 1273  | 0        | 641      | 31      | 0            |
| 15  | 6a    | 360   | 0        | 95       | 2       | 0            |
| 16  | 6b    | 296   | 0        | 76       | 5       | 0            |
| 17  | 6c    | 296   | 0        | 77       | 0       | 0            |
| 18  | 6d    | 288   | 0        | 78       | 0       | 0            |
| 19  | 6e    | 280   | 0        | 81       | 8       | 0            |
| 20  | 6f    | 260   | 0        | 75       | 0       | 0            |
| 21  | 6g    | 244   | 0        | 71       | 3       | 0            |
| 22  | 4A    | 2744  | 0        | 1395     | 65      | 0            |
| 23  | 4B    | 2076  | 0        | 2148     | 29      | 0            |
| 24  | 4C    | 3370  | 0        | 3300     | 46      | 0            |
| 25  | 4D    | 2874  | 0        | 2856     | 25      | 0            |
| 26  | 4E    | 962   | 0        | 1012     | 2       | 0            |
| 27  | 4F    | 1169  | 0        | 1139     | 9       | 0            |
| 28  | 4G    | 5504  | 0        | 4772     | 47      | 0            |
| 29  | 4H    | 844   | 0        | 426      | 6       | 0            |
| 30  | 4I    | 494   | 0        | 384      | 8       | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 31  | 4J    | 1144  | 0        | 1094     | 10      | 0            |
| 32  | 4K    | 1192  | 0        | 841      | 9       | 0            |
| 33  | 4L    | 1452  | 0        | 1465     | 31      | 0            |
| 34  | 4M    | 599   | 0        | 613      | 5       | 0            |
| 35  | 4N    | 640   | 0        | 664      | 16      | 0            |
| 36  | 4Z    | 2092  | 0        | 992      | 15      | 0            |
| 37  | 2A    | 2311  | 0        | 1170     | 144     | 0            |
| 38  | 2B    | 648   | 0        | 167      | 1       | 0            |
| 39  | 2C    | 376   | 0        | 102      | 0       | 0            |
| 40  | 2D    | 1134  | 0        | 764      | 8       | 0            |
| 41  | 2E    | 376   | 0        | 85       | 0       | 0            |
| 42  | 2F    | 1693  | 0        | 454      | 22      | 0            |
| 43  | 2G    | 4192  | 0        | 1110     | 234     | 0            |
| 44  | 2H    | 959   | 0        | 417      | 11      | 0            |
| 45  | 2I    | 4672  | 0        | 1260     | 71      | 0            |
| 46  | 2J    | 312   | 0        | 87       | 3       | 0            |
| 47  | 2K    | 432   | 0        | 114      | 6       | 0            |
| 48  | 2L    | 356   | 0        | 105      | 4       | 0            |
| 49  | 2M    | 264   | 0        | 70       | 11      | 0            |
| 50  | 5B    | 36    | 0        | 6        | 0       | 0            |
| 51  | 5C    | 32    | 0        | 12       | 2       | 0            |
| 52  | 5C    | 1     | 0        | 0        | 0       | 0            |
| 53  | 4I    | 1     | 0        | 0        | 0       | 0            |
| 53  | 4N    | 1     | 0        | 0        | 0       | 0            |
| All | All   | 98459 | 0        | 72990    | 1644    | 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 10.

All (1644) 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) |
|------------------|------------------|--------------------------|-------------------|
| 43:2G:407:MET:N  | 43:2G:407:MET:CA | 1.71                     | 1.53              |
| 1:A:30:C:C2'     | 1:A:31:C:H5''    | 1.54                     | 1.35              |
| 30:4I:8:GLN:HE21 | 30:4I:8:GLN:N    | 1.33                     | 1.24              |
| 1:A:30:C:N4      | 1:A:31:C:C4      | 2.10                     | 1.18              |
| 1:A:38:C:H4'     | 1:A:39:U:OP1     | 1.42                     | 1.18              |
| 1:A:30:C:C4      | 1:A:31:C:C5      | 2.34                     | 1.16              |
| 1:A:22:C:O2'     | 1:A:23:G:H5'     | 1.45                     | 1.15              |
| 1:A:34:G:C8      | 1:A:35:U:C5      | 2.34                     | 1.15              |
| 22:4A:119:A:H5'' | 10:4d:39:TYR:CA  | 1.75                     | 1.14              |

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| Atom-1           | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|------------------|--------------------|--------------------------|-------------------|
| 1:A:30:C:H2'     | 1:A:31:C:C5'       | 1.78                     | 1.13              |
| 3:5B:2038:GLN:CB | 5:5D:1035:LEU:CD1  | 2.26                     | 1.12              |
| 37:2A:156:U:H6   | 37:2A:156:U:H5''   | 1.09                     | 1.09              |
| 3:5B:2038:GLN:CB | 5:5D:1035:LEU:HD12 | 1.83                     | 1.08              |
| 37:2A:105:G:H2'  | 37:2A:106:G:H5''   | 1.37                     | 1.06              |
| 2:5A:90:U:C5     | 13:5g:38:ASN:O     | 2.09                     | 1.06              |
| 1:A:30:C:C3'     | 1:A:31:C:H5''      | 1.84                     | 1.04              |
| 1:A:40:U:H4'     | 1:A:41:U:H5'       | 1.38                     | 1.04              |
| 22:4A:118:A:C2   | 22:4A:119:A:N6     | 2.25                     | 1.03              |
| 22:4A:126:A:C2   | 9:4c:104:ASP:CA    | 2.41                     | 1.03              |
| 3:5B:2036:GLN:O  | 5:5D:1035:LEU:HD13 | 1.58                     | 1.02              |
| 1:A:30:C:H2'     | 1:A:31:C:H5''      | 1.03                     | 1.02              |
| 1:A:34:G:C8      | 1:A:35:U:C4        | 2.47                     | 1.02              |
| 3:5B:2038:GLN:N  | 5:5D:1035:LEU:HD11 | 1.73                     | 1.01              |
| 2:5A:95:G:H1'    | 10:5d:24:LYS:CA    | 1.90                     | 1.01              |
| 1:A:30:C:C3'     | 1:A:31:C:C5'       | 2.40                     | 1.00              |
| 22:4A:91:A:H2    | 22:4A:110:G:N2     | 1.61                     | 0.98              |
| 37:2A:168:A:C8   | 37:2A:168:A:H5''   | 1.98                     | 0.97              |
| 1:A:31:C:C2      | 37:2A:33:G:N1      | 2.32                     | 0.97              |
| 1:A:30:C:C2'     | 1:A:31:C:C5'       | 2.38                     | 0.96              |
| 36:4Z:333:ILE:O  | 36:4Z:342:LEU:N    | 1.98                     | 0.96              |
| 43:2G:501:LEU:O  | 43:2G:504:ILE:N    | 1.98                     | 0.96              |
| 3:5B:2038:GLN:N  | 5:5D:1035:LEU:CD1  | 2.29                     | 0.96              |
| 1:A:31:C:C2      | 37:2A:33:G:C6      | 2.53                     | 0.95              |
| 1:A:31:C:O2      | 37:2A:33:G:C6      | 2.20                     | 0.94              |
| 2:5A:93:U:H1'    | 9:5c:104:ASP:CA    | 1.96                     | 0.94              |
| 30:4I:8:GLN:N    | 30:4I:8:GLN:NE2    | 2.16                     | 0.93              |
| 37:2A:156:U:H5'' | 37:2A:156:U:C6     | 2.02                     | 0.93              |
| 43:2G:86:ALA:O   | 43:2G:89:ALA:N     | 2.02                     | 0.91              |
| 2:5A:95:G:H21    | 2:5A:96:A:H5''     | 1.36                     | 0.89              |
| 37:2A:54:U:OP1   | 42:2F:428:GLU:CA   | 2.20                     | 0.89              |
| 1:A:23:G:H1      | 37:2A:39:U:H3      | 1.20                     | 0.89              |
| 1:A:34:G:N7      | 1:A:35:U:C4        | 2.40                     | 0.89              |
| 2:5A:93:U:O4     | 10:5d:66:CYS:N     | 2.06                     | 0.89              |
| 1:A:40:U:O2'     | 1:A:41:U:OP2       | 1.89                     | 0.88              |
| 43:2G:793:LYS:O  | 43:2G:797:GLY:HA3  | 1.72                     | 0.88              |
| 2:5A:67:A:O2'    | 2:5A:68:C:OP1      | 1.89                     | 0.87              |
| 3:5B:2036:GLN:C  | 5:5D:1035:LEU:HD13 | 1.98                     | 0.87              |
| 3:5B:2038:GLN:CB | 5:5D:1035:LEU:HD11 | 2.04                     | 0.87              |
| 22:4A:120:U:H2'  | 11:4e:82:ASP:CA    | 2.04                     | 0.87              |
| 2:5A:93:U:C1'    | 9:5c:104:ASP:CA    | 2.52                     | 0.87              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 37:2A:154:C:O2    | 37:2A:176:G:N2    | 2.07                     | 0.87              |
| 1:A:12:U:OP2      | 1:A:12:U:H2'      | 1.74                     | 0.87              |
| 5:5D:1519:ARG:NH2 | 5:5D:1691:ALA:O   | 2.07                     | 0.86              |
| 37:2A:40:C:H5''   | 37:2A:40:C:H6     | 1.39                     | 0.86              |
| 37:2A:156:U:H6    | 37:2A:156:U:C5'   | 1.89                     | 0.86              |
| 2:5A:90:U:H5      | 13:5g:38:ASN:O    | 1.53                     | 0.86              |
| 5:5D:1622:GLU:OE2 | 5:5D:1649:SER:OG  | 1.93                     | 0.86              |
| 22:4A:118:A:H2    | 22:4A:119:A:H62   | 1.22                     | 0.86              |
| 27:4F:22:GLU:OE1  | 27:4F:22:GLU:N    | 2.08                     | 0.86              |
| 37:2A:168:A:H5''  | 37:2A:168:A:H8    | 1.36                     | 0.86              |
| 1:A:38:C:OP1      | 1:A:39:U:P        | 2.34                     | 0.85              |
| 22:4A:121:U:H3    | 12:4f:63:ARG:CA   | 1.88                     | 0.85              |
| 5:5D:471:ALA:HB1  | 5:5D:518:LEU:HD13 | 1.58                     | 0.85              |
| 28:4G:354:PRO:O   | 28:4G:357:THR:OG1 | 1.93                     | 0.85              |
| 43:2G:728:LEU:O   | 43:2G:731:LEU:N   | 2.10                     | 0.85              |
| 1:A:11:C:H2'      | 1:A:11:C:O2       | 1.75                     | 0.84              |
| 1:A:30:C:H3'      | 1:A:31:C:C5'      | 2.04                     | 0.84              |
| 22:4A:118:A:N3    | 22:4A:119:A:N6    | 2.23                     | 0.84              |
| 22:4A:119:A:C5'   | 10:4d:39:TYR:CA   | 2.56                     | 0.84              |
| 4:5C:256:CYS:HA   | 4:5C:308:CYS:HB3  | 1.60                     | 0.83              |
| 1:A:36:C:H1'      | 1:A:37:C:OP1      | 1.78                     | 0.83              |
| 3:5B:1412:TRP:O   | 3:5B:1420:ASN:ND2 | 2.10                     | 0.83              |
| 37:2A:152:G:N2    | 37:2A:153:A:N7    | 2.27                     | 0.83              |
| 1:A:30:C:C5       | 1:A:31:C:C5       | 2.67                     | 0.83              |
| 3:5B:2038:GLN:H   | 5:5D:1035:LEU:CD1 | 1.90                     | 0.83              |
| 35:4N:125:ARG:O   | 35:4N:129:ASN:ND2 | 2.11                     | 0.82              |
| 1:A:99:C:O2'      | 1:A:100:C:OP2     | 1.96                     | 0.82              |
| 19:6e:46:GLU:CA   | 19:6e:63:ALA:N    | 2.43                     | 0.82              |
| 22:4A:49:C:OP1    | 28:4G:172:ARG:NH1 | 2.12                     | 0.82              |
| 36:4Z:334:HIS:HA  | 36:4Z:341:THR:HA  | 1.62                     | 0.81              |
| 25:4D:115:ARG:O   | 25:4D:119:SER:OG  | 1.98                     | 0.81              |
| 37:2A:105:G:C2'   | 37:2A:106:G:H5''  | 2.10                     | 0.81              |
| 43:2G:648:LEU:O   | 43:2G:651:VAL:N   | 2.13                     | 0.81              |
| 45:2I:839:ALA:O   | 45:2I:843:LEU:N   | 2.13                     | 0.81              |
| 3:5B:292:ASP:OD1  | 3:5B:1139:ARG:NH1 | 2.13                     | 0.81              |
| 1:A:31:C:O2       | 37:2A:33:G:N1     | 2.13                     | 0.81              |
| 5:5D:991:TYR:OH   | 5:5D:1097:GLU:OE2 | 1.97                     | 0.81              |
| 1:A:36:C:H4'      | 1:A:37:C:H5       | 1.44                     | 0.81              |
| 37:2A:152:G:H5''  | 37:2A:153:A:OP2   | 1.80                     | 0.81              |
| 1:A:34:G:C2       | 1:A:35:U:H2'      | 2.16                     | 0.81              |
| 1:A:27:U:OP2      | 43:2G:1106:ARG:CA | 2.30                     | 0.80              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:A:20:U:O2       | 37:2A:42:G:C2     | 2.35                     | 0.80              |
| 33:4L:29:ILE:HD11 | 33:4L:71:LEU:HD22 | 1.62                     | 0.80              |
| 2:5A:92:U:H3      | 8:5b:36:MET:CA    | 1.93                     | 0.80              |
| 22:4A:108:C:O2'   | 22:4A:109:G:H5'   | 1.81                     | 0.80              |
| 1:A:34:G:N9       | 1:A:35:U:C5       | 2.49                     | 0.80              |
| 1:A:28:G:H5'      | 1:A:28:G:H8       | 1.45                     | 0.79              |
| 1:A:32:C:O2       | 37:2A:31:G:N1     | 2.11                     | 0.79              |
| 37:2A:101:U:H5''  | 37:2A:102:U:H5'   | 1.65                     | 0.79              |
| 3:5B:1793:THR:OG1 | 3:5B:1797:ASN:OD1 | 1.99                     | 0.79              |
| 5:5D:1151:GLU:OE2 | 5:5D:1151:GLU:N   | 2.16                     | 0.79              |
| 4:5C:623:GLU:OE1  | 4:5C:624:SER:OG   | 2.00                     | 0.79              |
| 2:5A:94:U:H1'     | 2:5A:95:G:OP1     | 1.82                     | 0.79              |
| 48:2L:56:GLY:O    | 48:2L:65:GLY:N    | 2.12                     | 0.79              |
| 1:A:23:G:N2       | 37:2A:39:U:O2     | 2.14                     | 0.79              |
| 37:2A:54:U:OP1    | 42:2F:424:ARG:O   | 2.00                     | 0.79              |
| 43:2G:669:GLN:O   | 43:2G:672:ALA:N   | 2.16                     | 0.79              |
| 1:A:28:G:H5'      | 1:A:28:G:C8       | 2.18                     | 0.79              |
| 1:A:30:C:N4       | 1:A:31:C:N4       | 2.31                     | 0.78              |
| 3:5B:1217:GLN:OE1 | 3:5B:1224:ARG:NH1 | 2.15                     | 0.78              |
| 1:A:31:C:H1'      | 37:2A:33:G:N2     | 1.99                     | 0.78              |
| 1:A:34:G:H2'      | 1:A:35:U:C6       | 2.19                     | 0.78              |
| 3:5B:1972:THR:OG1 | 3:5B:1975:GLU:OE1 | 1.99                     | 0.78              |
| 1:A:36:C:H4'      | 1:A:37:C:C5       | 2.18                     | 0.78              |
| 45:2I:523:GLY:HA3 | 45:2I:536:TRP:O   | 1.83                     | 0.78              |
| 5:5D:1090:ARG:NH1 | 22:4A:75:C:O2'    | 2.17                     | 0.78              |
| 4:5C:569:ARG:O    | 4:5C:569:ARG:NH1  | 2.16                     | 0.78              |
| 1:A:31:C:O2       | 37:2A:33:G:C2     | 2.37                     | 0.77              |
| 45:2I:914:ILE:O   | 45:2I:918:ARG:CA  | 2.32                     | 0.77              |
| 28:4G:724:MET:HA  | 28:4G:724:MET:HE2 | 1.65                     | 0.77              |
| 43:2G:428:ALA:O   | 43:2G:432:THR:N   | 2.17                     | 0.77              |
| 1:A:115:U:H2'     | 1:A:116:G:C8      | 2.19                     | 0.77              |
| 3:5B:2188:LEU:O   | 3:5B:2251:TYR:OH  | 2.01                     | 0.77              |
| 5:5D:880:LEU:O    | 5:5D:884:ASN:ND2  | 2.17                     | 0.77              |
| 37:2A:177:A:H5''  | 37:2A:178:A:OP1   | 1.84                     | 0.77              |
| 1:A:8:U:O2        | 1:A:8:U:H2'       | 1.84                     | 0.77              |
| 4:5C:826:ARG:NH2  | 4:5C:910:ASP:OD2  | 2.18                     | 0.77              |
| 37:2A:153:A:H2'   | 37:2A:154:C:H5'   | 1.65                     | 0.76              |
| 43:2G:1246:MET:O  | 43:2G:1249:TYR:N  | 2.18                     | 0.76              |
| 1:A:34:G:H3'      | 1:A:35:U:H5''     | 1.67                     | 0.76              |
| 1:A:40:U:H4'      | 1:A:41:U:C5'      | 2.13                     | 0.76              |
| 22:4A:121:U:N3    | 12:4f:63:ARG:CA   | 2.48                     | 0.76              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:A:31:C:H1'      | 37:2A:33:G:C2     | 2.20                     | 0.76              |
| 24:4C:262:ASP:OD2 | 24:4C:264:ASN:ND2 | 2.19                     | 0.76              |
| 24:4C:513:ASP:OD1 | 28:4G:802:LYS:NZ  | 2.18                     | 0.76              |
| 43:2G:531:LEU:O   | 43:2G:534:GLN:N   | 2.18                     | 0.76              |
| 42:2F:276:GLY:C   | 42:2F:278:LEU:H   | 1.92                     | 0.75              |
| 33:4L:166:GLN:OE1 | 33:4L:166:GLN:N   | 2.19                     | 0.75              |
| 22:4A:1:A:OP1     | 23:4B:526:LYS:NZ  | 2.19                     | 0.75              |
| 43:2G:1016:LEU:O  | 43:2G:1019:ARG:N  | 2.19                     | 0.75              |
| 5:5D:1342:SER:O   | 5:5D:1486:ARG:NH2 | 2.20                     | 0.75              |
| 1:A:17:G:H1       | 37:2A:44:U:H3     | 1.33                     | 0.75              |
| 37:2A:153:A:C2'   | 37:2A:154:C:H5'   | 2.17                     | 0.75              |
| 1:A:30:C:C4       | 1:A:31:C:C6       | 2.76                     | 0.74              |
| 37:2A:143:A:H3'   | 37:2A:143:A:N3    | 2.01                     | 0.74              |
| 4:5C:561:LYS:NZ   | 4:5C:611:ASN:O    | 2.21                     | 0.74              |
| 2:5A:59:G:OP1     | 3:5B:417:ARG:NH2  | 2.20                     | 0.74              |
| 33:4L:155:GLU:OE2 | 33:4L:155:GLU:N   | 2.19                     | 0.74              |
| 43:2G:1270:ASN:O  | 43:2G:1273:TYR:N  | 2.21                     | 0.74              |
| 45:2I:304:GLN:CA  | 45:2I:309:ASP:O   | 2.36                     | 0.74              |
| 22:4A:57:G:N7     | 25:4D:354:ARG:NH1 | 2.35                     | 0.74              |
| 42:2F:184:ARG:O   | 7:2a:85:PRO:N     | 2.21                     | 0.74              |
| 1:A:31:C:O2       | 37:2A:33:G:C5     | 2.41                     | 0.74              |
| 2:5A:93:U:O4      | 10:5d:65:ARG:CA   | 2.35                     | 0.73              |
| 22:4A:91:A:H2     | 22:4A:110:G:H22   | 0.82                     | 0.73              |
| 24:4C:104:ASP:OD1 | 24:4C:106:SER:OG  | 2.04                     | 0.73              |
| 43:2G:874:LYS:O   | 43:2G:877:GLY:N   | 2.20                     | 0.73              |
| 45:2I:442:LEU:O   | 45:2I:735:SER:N   | 2.19                     | 0.73              |
| 1:A:38:C:OP1      | 1:A:39:U:OP1      | 2.06                     | 0.73              |
| 1:A:34:G:H2'      | 1:A:35:U:H6       | 1.52                     | 0.73              |
| 2:5A:117:A:N1     | 10:5d:26:GLY:HA3  | 2.03                     | 0.73              |
| 3:5B:138:PRO:O    | 3:5B:142:SER:OG   | 2.07                     | 0.73              |
| 43:2G:660:ALA:O   | 43:2G:663:THR:N   | 2.22                     | 0.73              |
| 5:5D:730:GLU:O    | 5:5D:734:THR:HG22 | 1.89                     | 0.73              |
| 42:2F:276:GLY:O   | 42:2F:278:LEU:N   | 2.20                     | 0.73              |
| 37:2A:179:C:H2'   | 37:2A:180:G:H8    | 1.54                     | 0.72              |
| 3:5B:510:ARG:NH2  | 28:4G:35:GLY:O    | 2.22                     | 0.72              |
| 37:2A:106:G:H21   | 37:2A:107:A:N6    | 1.87                     | 0.72              |
| 19:6e:46:GLU:N    | 19:6e:63:ALA:H    | 1.87                     | 0.72              |
| 33:4L:18:GLN:OE1  | 33:4L:30:TYR:OH   | 2.05                     | 0.72              |
| 45:2I:753:GLY:HA3 | 45:2I:765:LEU:O   | 1.88                     | 0.72              |
| 5:5D:441:GLY:O    | 5:5D:693:THR:OG1  | 2.08                     | 0.72              |
| 5:5D:622:ASP:OD1  | 5:5D:623:ASP:N    | 2.22                     | 0.72              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 43:2G:1055:TRP:O   | 43:2G:1058:ILE:N   | 2.22                     | 0.72              |
| 2:5A:96:A:H61      | 12:5f:23:GLY:H     | 1.38                     | 0.72              |
| 5:5D:1945:LEU:HA   | 5:5D:1948:MET:HE3  | 1.72                     | 0.72              |
| 1:A:15:A:H2'       | 1:A:16:A:O4'       | 1.89                     | 0.72              |
| 1:A:19:U:H3        | 37:2A:42:G:H1      | 1.37                     | 0.72              |
| 3:5B:105:ASN:ND2   | 3:5B:131:GLU:OE1   | 2.23                     | 0.72              |
| 4:5C:196:LYS:HA    | 13:5g:33:ILE:O     | 1.90                     | 0.72              |
| 43:2G:87:PRO:O     | 43:2G:91:LEU:N     | 2.21                     | 0.72              |
| 43:2G:535:ILE:O    | 43:2G:538:LEU:N    | 2.23                     | 0.72              |
| 1:A:21:U:H1'       | 1:A:22:C:OP1       | 1.90                     | 0.72              |
| 3:5B:919:ASP:OD2   | 3:5B:1012:LYS:NZ   | 2.22                     | 0.72              |
| 27:4F:107:GLU:OE1  | 27:4F:107:GLU:N    | 2.17                     | 0.72              |
| 43:2G:994:LEU:O    | 43:2G:997:LEU:N    | 2.22                     | 0.71              |
| 3:5B:2295:GLU:OE2  | 3:5B:2295:GLU:N    | 2.22                     | 0.71              |
| 43:2G:122:HIS:O    | 43:2G:125:THR:N    | 2.22                     | 0.71              |
| 43:2G:791:VAL:O    | 43:2G:794:GLN:N    | 2.23                     | 0.71              |
| 37:2A:106:G:H4'    | 37:2A:107:A:O4'    | 1.89                     | 0.71              |
| 2:5A:96:A:H4'      | 2:5A:97:G:H5''     | 1.72                     | 0.71              |
| 3:5B:189:GLU:O     | 3:5B:564:TYR:OH    | 2.08                     | 0.71              |
| 37:2A:153:A:H2'    | 37:2A:154:C:C5'    | 2.19                     | 0.71              |
| 1:A:38:C:OP1       | 1:A:39:U:OP2       | 2.09                     | 0.71              |
| 14:6A:86:U:H3      | 37:2A:12:G:H1      | 1.39                     | 0.71              |
| 19:6e:46:GLU:N     | 19:6e:63:ALA:N     | 2.38                     | 0.71              |
| 2:5A:92:U:N3       | 8:5b:36:MET:CA     | 2.53                     | 0.70              |
| 3:5B:2278:SER:OG   | 3:5B:2309:HIS:NE2  | 2.22                     | 0.70              |
| 29:4H:20:GLY:N     | 29:4H:168:PRO:O    | 2.24                     | 0.70              |
| 35:4N:122:VAL:HG12 | 35:4N:126:PHE:CE2  | 2.26                     | 0.70              |
| 2:5A:87:A:N6       | 2:5A:92:U:P        | 2.64                     | 0.70              |
| 3:5B:2038:GLN:CA   | 5:5D:1035:LEU:HD11 | 2.22                     | 0.70              |
| 37:2A:54:U:OP1     | 42:2F:427:ALA:O    | 2.10                     | 0.70              |
| 2:5A:94:U:C1'      | 2:5A:95:G:OP1      | 2.39                     | 0.70              |
| 4:5C:198:TYR:CE2   | 4:5C:435:VAL:HG11  | 2.27                     | 0.70              |
| 43:2G:700:LYS:O    | 43:2G:703:THR:N    | 2.24                     | 0.70              |
| 44:2H:479:ASP:O    | 44:2H:482:ALA:N    | 2.25                     | 0.70              |
| 5:5D:1041:LEU:HD23 | 5:5D:1041:LEU:O    | 1.90                     | 0.70              |
| 5:5D:1699:GLU:OE2  | 5:5D:1701:ARG:NH1  | 2.25                     | 0.70              |
| 4:5C:269:LEU:O     | 4:5C:378:TYR:OH    | 2.08                     | 0.70              |
| 14:6A:103:U:O4     | 21:6g:32:GLN:O     | 2.10                     | 0.70              |
| 37:2A:40:C:H6      | 37:2A:40:C:C5'     | 2.05                     | 0.69              |
| 45:2I:545:VAL:N    | 45:2I:557:ALA:O    | 2.25                     | 0.69              |
| 37:2A:154:C:H2'    | 37:2A:155:C:C6     | 2.26                     | 0.69              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:5B:2036:GLN:O    | 5:5D:1035:LEU:CD1  | 2.40                     | 0.69              |
| 5:5D:1201:GLU:N    | 5:5D:1201:GLU:OE1  | 2.26                     | 0.69              |
| 5:5D:731:THR:HG23  | 5:5D:810:VAL:HG12  | 1.74                     | 0.69              |
| 5:5D:816:ALA:O     | 5:5D:855:ARG:NH2   | 2.26                     | 0.69              |
| 37:2A:153:A:N6     | 37:2A:177:A:C2     | 2.60                     | 0.69              |
| 2:5A:93:U:O4       | 10:5d:65:ARG:C     | 2.36                     | 0.69              |
| 32:4K:350:ASP:OD1  | 32:4K:351:GLU:N    | 2.25                     | 0.69              |
| 48:2L:7:ASP:O      | 48:2L:91:LEU:N     | 2.25                     | 0.69              |
| 1:A:30:C:H41       | 1:A:31:C:N4        | 1.91                     | 0.69              |
| 5:5D:1186:LEU:HD21 | 5:5D:1270:VAL:HG23 | 1.75                     | 0.69              |
| 45:2I:558:LEU:O    | 45:2I:561:GLY:N    | 2.24                     | 0.69              |
| 22:4A:120:U:C2'    | 11:4e:82:ASP:CA    | 2.70                     | 0.69              |
| 14:6A:65:G:H21     | 23:4B:515:ASN:HD21 | 1.41                     | 0.68              |
| 14:6A:102:A:O2'    | 21:6g:33:THR:CA    | 2.41                     | 0.68              |
| 2:5A:87:A:N6       | 2:5A:92:U:OP2      | 2.26                     | 0.68              |
| 37:2A:30:A:N3      | 37:2A:30:A:H2'     | 2.06                     | 0.68              |
| 14:6A:103:U:H3'    | 14:6A:104:U:H5''   | 1.75                     | 0.68              |
| 1:A:30:C:C4        | 1:A:31:C:C4        | 2.69                     | 0.68              |
| 4:5C:249:GLU:OE2   | 4:5C:249:GLU:O     | 2.10                     | 0.68              |
| 3:5B:1610:GLN:NE2  | 3:5B:1612:GLU:OE1  | 2.27                     | 0.67              |
| 5:5D:1980:GLU:N    | 5:5D:1980:GLU:OE1  | 2.27                     | 0.67              |
| 3:5B:1977:ILE:O    | 3:5B:1981:VAL:HG23 | 1.94                     | 0.67              |
| 37:2A:143:A:H2'    | 37:2A:144:C:H6     | 1.59                     | 0.67              |
| 1:A:36:C:C4'       | 1:A:37:C:H5        | 2.07                     | 0.67              |
| 5:5D:748:LEU:HD23  | 5:5D:748:LEU:O     | 1.94                     | 0.67              |
| 44:2H:596:GLU:C    | 44:2H:598:GLU:H    | 2.00                     | 0.67              |
| 2:5A:97:G:H1       | 2:5A:116:U:H3      | 1.41                     | 0.67              |
| 37:2A:152:G:O3'    | 37:2A:153:A:O4'    | 2.11                     | 0.67              |
| 1:A:22:C:O5'       | 1:A:22:C:H6        | 1.78                     | 0.67              |
| 2:5A:95:G:H21      | 2:5A:96:A:C5'      | 2.06                     | 0.67              |
| 3:5B:2237:TRP:NE1  | 3:5B:2250:GLY:O    | 2.28                     | 0.67              |
| 45:2I:1148:LEU:O   | 45:2I:1152:HIS:N   | 2.27                     | 0.67              |
| 1:A:31:C:H5'       | 1:A:31:C:H6        | 1.58                     | 0.67              |
| 5:5D:569:LEU:HB2   | 5:5D:575:LEU:HD12  | 1.77                     | 0.67              |
| 23:4B:674:LEU:O    | 23:4B:678:VAL:HG23 | 1.95                     | 0.67              |
| 33:4L:135:ARG:NH2  | 33:4L:159:ASP:OD1  | 2.26                     | 0.67              |
| 36:4Z:362:HIS:O    | 36:4Z:378:MET:N    | 2.26                     | 0.67              |
| 37:2A:151:C:C2     | 37:2A:152:G:C8     | 2.83                     | 0.67              |
| 1:A:30:C:N4        | 1:A:31:C:C5        | 2.50                     | 0.67              |
| 22:4A:111:C:H6     | 22:4A:111:C:O5'    | 1.78                     | 0.67              |
| 4:5C:623:GLU:OE2   | 4:5C:623:GLU:N     | 2.27                     | 0.66              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 37:2A:150:U:H3     | 37:2A:181:G:H1     | 1.41                     | 0.66              |
| 5:5D:1218:SER:HB3  | 5:5D:1240:LEU:HD21 | 1.76                     | 0.66              |
| 28:4G:513:CYS:O    | 28:4G:517:GLY:N    | 2.27                     | 0.66              |
| 3:5B:2278:SER:HG   | 3:5B:2309:HIS:HE2  | 1.37                     | 0.66              |
| 5:5D:1943:MET:HE1  | 5:5D:2065:TRP:HB2  | 1.77                     | 0.66              |
| 37:2A:151:C:H2'    | 37:2A:152:G:H8     | 1.60                     | 0.66              |
| 43:2G:758:ASP:O    | 43:2G:762:ALA:N    | 2.28                     | 0.66              |
| 43:2G:1280:LEU:O   | 43:2G:1283:HIS:N   | 2.22                     | 0.66              |
| 43:2G:400:SER:O    | 43:2G:404:LEU:N    | 2.28                     | 0.66              |
| 44:2H:487:LEU:O    | 44:2H:490:HIS:N    | 2.28                     | 0.66              |
| 45:2I:753:GLY:CA   | 45:2I:765:LEU:O    | 2.44                     | 0.66              |
| 3:5B:1974:GLU:N    | 3:5B:1974:GLU:OE1  | 2.27                     | 0.66              |
| 28:4G:921:ASN:HD22 | 28:4G:921:ASN:C    | 2.03                     | 0.66              |
| 37:2A:168:A:C8     | 37:2A:168:A:C5'    | 2.75                     | 0.66              |
| 3:5B:861:ARG:NH2   | 28:4G:178:LYS:O    | 2.28                     | 0.66              |
| 28:4G:297:LEU:O    | 28:4G:301:VAL:HG23 | 1.96                     | 0.66              |
| 37:2A:151:C:O2     | 37:2A:152:G:C8     | 2.48                     | 0.66              |
| 2:5A:93:U:O4'      | 9:5c:104:ASP:CA    | 2.42                     | 0.66              |
| 33:4L:83:GLU:O     | 33:4L:87:ILE:HD12  | 1.95                     | 0.66              |
| 43:2G:1243:PRO:O   | 43:2G:1246:MET:N   | 2.29                     | 0.66              |
| 14:6A:103:U:H4'    | 14:6A:104:U:OP2    | 1.95                     | 0.66              |
| 1:A:36:C:H1'       | 1:A:37:C:P         | 2.36                     | 0.66              |
| 37:2A:54:U:OP1     | 42:2F:427:ALA:C    | 2.39                     | 0.65              |
| 1:A:8:U:O2         | 1:A:8:U:C2'        | 2.44                     | 0.65              |
| 37:2A:153:A:C3'    | 37:2A:154:C:H5'    | 2.25                     | 0.65              |
| 3:5B:162:LYS:O     | 3:5B:573:GLN:NE2   | 2.30                     | 0.65              |
| 4:5C:152:GLN:NE2   | 4:5C:426:GLU:O     | 2.29                     | 0.65              |
| 40:2D:418:GLU:N    | 40:2D:418:GLU:OE1  | 2.30                     | 0.65              |
| 3:5B:1931:THR:OG1  | 23:4B:497:GLU:OE2  | 2.14                     | 0.65              |
| 33:4L:120:LEU:CB   | 33:4L:152:LEU:HD11 | 2.27                     | 0.65              |
| 43:2G:658:TRP:O    | 43:2G:661:ARG:N    | 2.30                     | 0.65              |
| 24:4C:241:PRO:O    | 24:4C:286:THR:OG1  | 2.13                     | 0.65              |
| 1:A:32:C:OP2       | 1:A:32:C:H3'       | 1.96                     | 0.65              |
| 5:5D:1538:ARG:NH1  | 5:5D:1665:ASP:OD1  | 2.30                     | 0.65              |
| 5:5D:1948:MET:O    | 5:5D:1952:ALA:N    | 2.30                     | 0.65              |
| 28:4G:326:GLN:O    | 28:4G:330:ASN:ND2  | 2.29                     | 0.65              |
| 1:A:11:C:O2        | 1:A:11:C:C2'       | 2.45                     | 0.64              |
| 2:5A:89:U:H2'      | 2:5A:90:U:H5''     | 1.79                     | 0.64              |
| 3:5B:858:GLN:OE1   | 3:5B:861:ARG:NH1   | 2.30                     | 0.64              |
| 5:5D:769:CYS:SG    | 5:5D:770:LYS:N     | 2.69                     | 0.64              |
| 43:2G:886:HIS:O    | 43:2G:889:GLU:N    | 2.30                     | 0.64              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 5:5D:488:LEU:HD12  | 5:5D:488:LEU:O     | 1.98                     | 0.64              |
| 45:2I:325:ILE:O    | 45:2I:375:SER:N    | 2.30                     | 0.64              |
| 1:A:36:C:C4'       | 1:A:37:C:C5        | 2.79                     | 0.64              |
| 5:5D:526:ASN:O     | 5:5D:529:GLY:N     | 2.30                     | 0.64              |
| 22:4A:117:C:O5'    | 22:4A:117:C:H6     | 1.80                     | 0.64              |
| 37:2A:114:A:H61    | 37:2A:142:C:H42    | 1.44                     | 0.64              |
| 2:5A:85:C:OP1      | 9:5c:20:GLU:CA     | 2.46                     | 0.64              |
| 43:2G:1109:ARG:O   | 43:2G:1110:VAL:C   | 2.41                     | 0.64              |
| 49:2M:40:TYR:O     | 49:2M:43:TYR:N     | 2.31                     | 0.64              |
| 1:A:22:C:O2'       | 1:A:23:G:C5'       | 2.37                     | 0.64              |
| 1:A:22:C:C2'       | 1:A:23:G:H5'       | 2.28                     | 0.64              |
| 28:4G:493:SER:O    | 28:4G:497:ASN:N    | 2.31                     | 0.64              |
| 5:5D:1936:LEU:HD23 | 5:5D:1937:SER:N    | 2.12                     | 0.64              |
| 22:4A:120:U:OP2    | 10:4d:39:TYR:O     | 2.16                     | 0.64              |
| 36:4Z:334:HIS:CA   | 36:4Z:341:THR:HA   | 2.27                     | 0.64              |
| 3:5B:2072:GLU:HB2  | 3:5B:2075:VAL:HG22 | 1.80                     | 0.64              |
| 1:A:99:C:HO2'      | 1:A:100:C:P        | 2.21                     | 0.64              |
| 37:2A:147:G:H2'    | 37:2A:148:C:H6     | 1.63                     | 0.64              |
| 40:2D:413:SER:OG   | 40:2D:416:THR:O    | 2.09                     | 0.64              |
| 44:2H:491:LEU:O    | 44:2H:494:THR:N    | 2.30                     | 0.64              |
| 5:5D:1383:GLU:N    | 5:5D:1383:GLU:OE1  | 2.31                     | 0.64              |
| 37:2A:154:C:H2'    | 37:2A:155:C:H6     | 1.63                     | 0.63              |
| 45:2I:868:VAL:O    | 45:2I:877:LEU:N    | 2.30                     | 0.63              |
| 1:A:35:U:OP1       | 48:2L:63:GLY:HA3   | 1.98                     | 0.63              |
| 3:5B:715:GLU:OE1   | 3:5B:718:ARG:NH1   | 2.31                     | 0.63              |
| 28:4G:426:ALA:O    | 28:4G:430:CYS:N    | 2.30                     | 0.63              |
| 37:2A:152:G:C2     | 37:2A:153:A:C5     | 2.87                     | 0.63              |
| 1:A:20:U:H5'       | 1:A:21:U:OP2       | 1.99                     | 0.63              |
| 43:2G:749:ALA:O    | 43:2G:752:TYR:N    | 2.31                     | 0.63              |
| 43:2G:1018:PRO:O   | 43:2G:1021:THR:N   | 2.30                     | 0.63              |
| 45:2I:563:LEU:N    | 45:2I:581:LYS:O    | 2.27                     | 0.63              |
| 45:2I:645:MET:N    | 45:2I:662:PHE:O    | 2.28                     | 0.63              |
| 3:5B:2038:GLN:CA   | 5:5D:1035:LEU:CD1  | 2.76                     | 0.63              |
| 22:4A:127:C:O2     | 9:4c:47:ARG:O      | 2.17                     | 0.63              |
| 1:A:31:C:N3        | 37:2A:33:G:C6      | 2.66                     | 0.63              |
| 37:2A:164:C:H6     | 37:2A:164:C:H5'    | 1.63                     | 0.63              |
| 2:5A:88:A:H2'      | 2:5A:88:A:N3       | 2.14                     | 0.63              |
| 5:5D:793:ASP:O     | 5:5D:797:VAL:HG23  | 1.98                     | 0.63              |
| 4:5C:283:ASP:OD1   | 4:5C:284:GLU:N     | 2.32                     | 0.63              |
| 22:4A:108:C:H2'    | 22:4A:109:G:H8     | 1.63                     | 0.63              |
| 37:2A:153:A:H3'    | 37:2A:154:C:H5'    | 1.79                     | 0.63              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 2:5A:90:U:H5       | 13:5g:38:ASN:C     | 2.06                     | 0.63              |
| 5:5D:602:GLU:OE1   | 5:5D:606:THR:OG1   | 2.16                     | 0.63              |
| 4:5C:359:LYS:HD2   | 4:5C:359:LYS:O     | 1.98                     | 0.63              |
| 22:4A:89:U:C2'     | 22:4A:90:G:H5'     | 2.29                     | 0.63              |
| 22:4A:89:U:O2'     | 22:4A:90:G:H5'     | 1.99                     | 0.63              |
| 28:4G:11:MET:SD    | 28:4G:11:MET:N     | 2.72                     | 0.63              |
| 33:4L:166:GLN:O    | 33:4L:167:LYS:HD3  | 1.98                     | 0.63              |
| 37:2A:156:U:C6     | 37:2A:156:U:C5'    | 2.72                     | 0.63              |
| 4:5C:198:TYR:CD2   | 4:5C:435:VAL:HG11  | 2.33                     | 0.62              |
| 22:4A:91:A:O5'     | 22:4A:91:A:H8      | 1.82                     | 0.62              |
| 25:4D:399:LEU:O    | 28:4G:289:ASN:ND2  | 2.32                     | 0.62              |
| 43:2G:1264:VAL:O   | 43:2G:1267:LYS:N   | 2.32                     | 0.62              |
| 45:2I:1191:LYS:O   | 45:2I:1194:SER:N   | 2.32                     | 0.62              |
| 5:5D:760:GLU:O     | 5:5D:764:THR:HG23  | 1.99                     | 0.62              |
| 33:4L:176:GLN:OE1  | 33:4L:176:GLN:N    | 2.33                     | 0.62              |
| 1:A:31:C:C2        | 1:A:32:C:C5        | 2.87                     | 0.62              |
| 3:5B:143:GLN:NE2   | 3:5B:207:PHE:O     | 2.32                     | 0.62              |
| 5:5D:537:LYS:N     | 5:5D:608:LEU:O     | 2.32                     | 0.62              |
| 4:5C:260:ILE:HD12  | 4:5C:263:LEU:HD12  | 1.82                     | 0.62              |
| 5:5D:1960:LEU:HD12 | 5:5D:1982:VAL:HG22 | 1.82                     | 0.62              |
| 43:2G:179:GLY:O    | 43:2G:182:LYS:N    | 2.33                     | 0.62              |
| 1:A:31:C:H2'       | 1:A:32:C:H6        | 1.65                     | 0.62              |
| 3:5B:235:MET:HA    | 3:5B:235:MET:HE3   | 1.81                     | 0.62              |
| 24:4C:128:GLU:OE2  | 40:2D:442:ARG:NH2  | 2.32                     | 0.62              |
| 37:2A:143:A:H2'    | 37:2A:144:C:C6     | 2.35                     | 0.62              |
| 1:A:31:C:C2'       | 1:A:32:C:H5'       | 2.30                     | 0.62              |
| 2:5A:95:G:N3       | 2:5A:95:G:H2'      | 2.15                     | 0.62              |
| 3:5B:2231:THR:OG1  | 3:5B:2255:HIS:O    | 2.16                     | 0.61              |
| 4:5C:484:THR:HG21  | 4:5C:489:GLN:NE2   | 2.15                     | 0.61              |
| 23:4B:386:GLU:OE1  | 23:4B:386:GLU:N    | 2.33                     | 0.61              |
| 37:2A:112:G:H2'    | 37:2A:113:G:H8     | 1.65                     | 0.61              |
| 43:2G:914:PHE:O    | 43:2G:917:VAL:N    | 2.32                     | 0.61              |
| 45:2I:586:ASP:O    | 45:2I:610:VAL:N    | 2.32                     | 0.61              |
| 46:2J:77:ILE:O     | 46:2J:84:ILE:N     | 2.32                     | 0.61              |
| 5:5D:774:LEU:CD2   | 5:5D:778:LEU:HD11  | 2.30                     | 0.61              |
| 40:2D:252:PHE:CA   | 42:2F:63:ASP:CA    | 2.79                     | 0.61              |
| 43:2G:88:VAL:CA    | 43:2G:92:ASN:H     | 2.13                     | 0.61              |
| 5:5D:1849:ILE:HD13 | 5:5D:1923:ILE:CD1  | 2.30                     | 0.61              |
| 43:2G:784:MET:O    | 43:2G:787:ILE:N    | 2.34                     | 0.61              |
| 5:5D:639:ILE:HD11  | 5:5D:646:VAL:HG22  | 1.83                     | 0.61              |
| 37:2A:142:C:C2'    | 37:2A:143:A:H5'    | 2.30                     | 0.61              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 43:2G:897:LEU:O    | 43:2G:900:PHE:N    | 2.34                     | 0.61              |
| 1:A:31:C:O2'       | 1:A:32:C:H5'       | 2.00                     | 0.61              |
| 4:5C:118:PHE:O     | 4:5C:122:LEU:HD12  | 2.01                     | 0.61              |
| 4:5C:933:PHE:O     | 4:5C:937:THR:OG1   | 2.08                     | 0.61              |
| 5:5D:949:LEU:O     | 5:5D:953:ARG:NH1   | 2.34                     | 0.61              |
| 45:2I:973:GLY:HA3  | 45:2I:976:LYS:O    | 2.00                     | 0.61              |
| 1:A:40:U:H5''      | 1:A:41:U:H5''      | 1.82                     | 0.61              |
| 3:5B:1169:GLN:O    | 3:5B:1173:SER:OG   | 2.19                     | 0.61              |
| 4:5C:112:THR:HG22  | 4:5C:112:THR:O     | 2.01                     | 0.61              |
| 33:4L:107:MET:HE2  | 33:4L:107:MET:HA   | 1.81                     | 0.61              |
| 37:2A:157:G:H5''   | 37:2A:157:G:H8     | 1.65                     | 0.61              |
| 3:5B:840:ILE:HG22  | 3:5B:844:GLU:OE2   | 2.00                     | 0.61              |
| 43:2G:895:GLY:O    | 43:2G:898:TYR:N    | 2.34                     | 0.61              |
| 43:2G:981:TYR:O    | 43:2G:984:GLU:N    | 2.20                     | 0.61              |
| 1:A:35:U:H4'       | 1:A:36:C:OP2       | 1.98                     | 0.61              |
| 1:A:116:G:H22      | 14:6A:38:G:H22     | 1.49                     | 0.61              |
| 23:4B:480:ASN:OD1  | 23:4B:480:ASN:O    | 2.18                     | 0.61              |
| 35:4N:133:MET:SD   | 35:4N:134:GLU:N    | 2.74                     | 0.61              |
| 43:2G:173:ALA:C    | 43:2G:176:ALA:H    | 2.09                     | 0.61              |
| 5:5D:1456:VAL:HG22 | 5:5D:1491:SER:HB3  | 1.83                     | 0.61              |
| 5:5D:1428:THR:HG22 | 5:5D:1429:PRO:HD2  | 1.83                     | 0.60              |
| 43:2G:862:GLU:O    | 43:2G:865:ARG:N    | 2.33                     | 0.60              |
| 2:5A:19:A:O2'      | 2:5A:21:A:N1       | 2.30                     | 0.60              |
| 3:5B:2141:GLU:OE1  | 3:5B:2143:ARG:NH2  | 2.34                     | 0.60              |
| 1:A:13:U:H2'       | 1:A:14:G:H8        | 1.66                     | 0.60              |
| 5:5D:1078:MET:CE   | 5:5D:1082:VAL:HG23 | 2.30                     | 0.60              |
| 43:2G:551:LEU:O    | 43:2G:554:LYS:N    | 2.34                     | 0.60              |
| 45:2I:550:ASN:N    | 45:2I:553:GLN:O    | 2.27                     | 0.60              |
| 1:A:10:C:O2'       | 1:A:11:C:OP2       | 2.16                     | 0.60              |
| 5:5D:1604:LEU:HD13 | 5:5D:1609:LEU:HD22 | 1.83                     | 0.60              |
| 1:A:31:C:H2'       | 1:A:32:C:C6        | 2.36                     | 0.60              |
| 1:A:116:G:H22      | 14:6A:38:G:H1      | 1.49                     | 0.60              |
| 5:5D:789:MET:O     | 5:5D:794:ARG:NH1   | 2.35                     | 0.60              |
| 43:2G:953:ASP:O    | 43:2G:956:SER:N    | 2.34                     | 0.60              |
| 43:2G:1125:PRO:O   | 43:2G:1128:VAL:N   | 2.35                     | 0.60              |
| 1:A:21:U:H1'       | 1:A:22:C:P         | 2.41                     | 0.60              |
| 3:5B:388:LEU:O     | 4:5C:379:LYS:NZ    | 2.18                     | 0.60              |
| 5:5D:1569:THR:OG1  | 5:5D:1645:VAL:HG12 | 2.02                     | 0.60              |
| 4:5C:130:ARG:NH2   | 4:5C:439:PRO:O     | 2.35                     | 0.60              |
| 5:5D:1037:LEU:HG   | 5:5D:1052:ILE:HD11 | 1.83                     | 0.60              |
| 5:5D:1561:VAL:HG22 | 5:5D:1662:ILE:HB   | 1.84                     | 0.60              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 22:4A:118:A:H2     | 22:4A:119:A:N6     | 1.84                     | 0.60              |
| 30:4I:14:ASP:OD1   | 30:4I:15:TYR:N     | 2.34                     | 0.60              |
| 43:2G:610:ILE:O    | 43:2G:613:MET:N    | 2.34                     | 0.60              |
| 22:4A:20:A:OP2     | 25:4D:423:THR:HG23 | 2.01                     | 0.60              |
| 37:2A:153:A:N6     | 37:2A:177:A:H2     | 1.98                     | 0.60              |
| 45:2I:664:TYR:CA   | 45:2I:677:THR:O    | 2.50                     | 0.60              |
| 1:A:13:U:O5'       | 1:A:13:U:H6        | 1.84                     | 0.59              |
| 3:5B:888:GLN:NE2   | 3:5B:890:ALA:O     | 2.35                     | 0.59              |
| 4:5C:607:LEU:O     | 4:5C:610:VAL:HG22  | 2.02                     | 0.59              |
| 5:5D:1725:GLU:OE2  | 5:5D:1763:ARG:NH2  | 2.34                     | 0.59              |
| 43:2G:929:LEU:O    | 43:2G:932:ILE:N    | 2.34                     | 0.59              |
| 1:A:31:C:O2        | 37:2A:33:G:C4      | 2.56                     | 0.59              |
| 3:5B:306:GLN:NE2   | 4:5C:879:ASP:OD1   | 2.34                     | 0.59              |
| 19:6e:46:GLU:CA    | 19:6e:62:ASP:C     | 2.74                     | 0.59              |
| 36:4Z:334:HIS:HA   | 36:4Z:342:LEU:H    | 1.67                     | 0.59              |
| 37:2A:106:G:N2     | 37:2A:107:A:C6     | 2.67                     | 0.59              |
| 45:2I:15:SER:N     | 45:2I:33:SER:O     | 2.35                     | 0.59              |
| 5:5D:1248:ASP:OD1  | 5:5D:1248:ASP:N    | 2.35                     | 0.59              |
| 2:5A:95:G:N2       | 2:5A:96:A:H5''     | 2.13                     | 0.59              |
| 3:5B:194:GLU:N     | 3:5B:194:GLU:OE1   | 2.35                     | 0.59              |
| 5:5D:548:VAL:O     | 5:5D:552:VAL:HG23  | 2.02                     | 0.59              |
| 5:5D:551:MET:HA    | 5:5D:551:MET:HE2   | 1.84                     | 0.59              |
| 43:2G:1109:ARG:O   | 43:2G:1112:THR:N   | 2.36                     | 0.59              |
| 43:2G:1149:LYS:O   | 43:2G:1152:SER:N   | 2.36                     | 0.59              |
| 28:4G:921:ASN:C    | 28:4G:921:ASN:ND2  | 2.61                     | 0.59              |
| 43:2G:1182:LEU:O   | 43:2G:1185:ARG:N   | 2.35                     | 0.59              |
| 36:4Z:334:HIS:CB   | 36:4Z:341:THR:HA   | 2.33                     | 0.59              |
| 2:5A:95:G:O2'      | 10:5d:24:LYS:C     | 2.46                     | 0.59              |
| 47:2K:67:ILE:O     | 47:2K:70:ALA:N     | 2.36                     | 0.59              |
| 2:5A:87:A:N6       | 2:5A:91:U:O3'      | 2.36                     | 0.58              |
| 14:6A:103:U:C3'    | 14:6A:104:U:H5''   | 2.31                     | 0.58              |
| 43:2G:745:ALA:O    | 43:2G:748:LYS:N    | 2.36                     | 0.58              |
| 4:5C:759:LEU:HA    | 4:5C:762:VAL:HG22  | 1.85                     | 0.58              |
| 28:4G:118:GLU:OE2  | 28:4G:119:ARG:NH1  | 2.35                     | 0.58              |
| 1:A:22:C:HO2'      | 1:A:23:G:H5'       | 1.65                     | 0.58              |
| 2:5A:53:U:OP1      | 28:4G:123:ARG:NH1  | 2.36                     | 0.58              |
| 3:5B:1357:MET:SD   | 3:5B:1358:SER:N    | 2.75                     | 0.58              |
| 24:4C:403:LEU:HD12 | 24:4C:403:LEU:O    | 2.03                     | 0.58              |
| 43:2G:811:LEU:O    | 43:2G:814:PHE:N    | 2.36                     | 0.58              |
| 45:2I:931:VAL:O    | 45:2I:936:LYS:N    | 2.31                     | 0.58              |
| 1:A:117:G:H5''     | 35:4N:101:GLY:HA3  | 1.86                     | 0.58              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 40:2D:411:LEU:N    | 40:2D:419:LYS:HZ2  | 2.01                     | 0.58              |
| 43:2G:424:ILE:O    | 43:2G:428:ALA:N    | 2.36                     | 0.58              |
| 4:5C:215:VAL:HG11  | 4:5C:242:LEU:CD2   | 2.33                     | 0.58              |
| 5:5D:465:GLU:N     | 5:5D:465:GLU:OE1   | 2.36                     | 0.58              |
| 19:6e:46:GLU:H     | 19:6e:63:ALA:N     | 2.01                     | 0.58              |
| 1:A:30:C:H3'       | 1:A:31:C:H5'       | 1.83                     | 0.58              |
| 24:4C:120:THR:HG22 | 24:4C:129:ARG:NH1  | 2.19                     | 0.58              |
| 3:5B:1208:THR:HG23 | 3:5B:1208:THR:O    | 2.03                     | 0.58              |
| 5:5D:552:VAL:HG21  | 5:5D:568:GLU:HB2   | 1.86                     | 0.58              |
| 43:2G:929:LEU:O    | 43:2G:930:PRO:C    | 2.46                     | 0.58              |
| 44:2H:596:GLU:O    | 44:2H:598:GLU:N    | 2.37                     | 0.58              |
| 1:A:35:U:O2        | 1:A:35:U:O2'       | 2.22                     | 0.58              |
| 22:4A:110:G:O5'    | 22:4A:110:G:H8     | 1.87                     | 0.58              |
| 23:4B:416:ASN:ND2  | 24:4C:170:GLY:O    | 2.36                     | 0.58              |
| 43:2G:308:SER:O    | 43:2G:311:ALA:N    | 2.35                     | 0.58              |
| 1:A:30:C:N3        | 1:A:31:C:C6        | 2.72                     | 0.58              |
| 1:A:117:G:H2'      | 1:A:118:A:C8       | 2.39                     | 0.58              |
| 22:4A:108:C:C2'    | 22:4A:109:G:H5'    | 2.34                     | 0.58              |
| 5:5D:675:TYR:OH    | 5:5D:885:GLN:OE1   | 2.10                     | 0.58              |
| 5:5D:1197:THR:O    | 5:5D:1198:LEU:HD12 | 2.04                     | 0.58              |
| 22:4A:111:C:H2'    | 22:4A:112:A:H8     | 1.69                     | 0.58              |
| 45:2I:523:GLY:CA   | 45:2I:536:TRP:O    | 2.51                     | 0.58              |
| 49:2M:48:ASP:O     | 49:2M:51:ASN:N     | 2.37                     | 0.58              |
| 43:2G:892:LEU:O    | 43:2G:895:GLY:N    | 2.37                     | 0.57              |
| 36:4Z:382:GLU:O    | 36:4Z:383:CYS:CB   | 2.52                     | 0.57              |
| 43:2G:491:GLU:O    | 43:2G:494:GLU:N    | 2.32                     | 0.57              |
| 45:2I:1160:HIS:O   | 45:2I:1163:PHE:N   | 2.37                     | 0.57              |
| 1:A:36:C:C5'       | 1:A:37:C:H5        | 2.17                     | 0.57              |
| 24:4C:200:LYS:O    | 24:4C:207:ARG:NH1  | 2.36                     | 0.57              |
| 31:4J:352:GLU:OE2  | 31:4J:352:GLU:N    | 2.38                     | 0.57              |
| 5:5D:930:LEU:HD23  | 5:5D:949:LEU:HD12  | 1.86                     | 0.57              |
| 22:4A:37:C:H1'     | 22:4A:38:U:H2'     | 1.85                     | 0.57              |
| 42:2F:184:ARG:CA   | 7:2a:85:PRO:CA     | 2.82                     | 0.57              |
| 45:2I:638:GLU:N    | 45:2I:668:GLY:O    | 2.32                     | 0.57              |
| 4:5C:922:GLU:N     | 4:5C:922:GLU:OE1   | 2.37                     | 0.57              |
| 37:2A:152:G:N2     | 37:2A:153:A:C5     | 2.73                     | 0.57              |
| 1:A:34:G:C4        | 1:A:35:U:C6        | 2.93                     | 0.57              |
| 5:5D:1071:LYS:HA   | 5:5D:1071:LYS:HE2  | 1.87                     | 0.57              |
| 5:5D:1825:ASN:OD1  | 5:5D:1827:THR:N    | 2.38                     | 0.57              |
| 5:5D:1828:THR:OG1  | 5:5D:1853:ALA:N    | 2.35                     | 0.57              |
| 5:5D:1971:ILE:O    | 5:5D:1975:THR:HG23 | 2.05                     | 0.57              |

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| Atom-1             | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|-------------------|--------------------------|-------------------|
| 45:2I:914:ILE:O    | 45:2I:918:ARG:C   | 2.47                     | 0.57              |
| 5:5D:1752:VAL:HG11 | 32:4K:208:ASP:CB  | 2.34                     | 0.57              |
| 22:4A:126:A:N1     | 9:4c:104:ASP:CA   | 2.67                     | 0.57              |
| 1:A:34:G:N9        | 1:A:35:U:C6       | 2.72                     | 0.57              |
| 2:5A:96:A:N6       | 12:5f:23:GLY:H    | 2.02                     | 0.57              |
| 22:4A:121:U:C2     | 12:4f:63:ARG:CA   | 2.88                     | 0.57              |
| 1:A:31:C:C1'       | 37:2A:33:G:N2     | 2.68                     | 0.57              |
| 3:5B:1556:ASP:OD2  | 14:6A:44:G:N2     | 2.33                     | 0.57              |
| 23:4B:415:THR:HG23 | 23:4B:417:LEU:HG  | 1.87                     | 0.57              |
| 24:4C:426:SER:OG   | 24:4C:428:ASP:OD1 | 2.23                     | 0.57              |
| 37:2A:152:G:N2     | 37:2A:153:A:C8    | 2.73                     | 0.57              |
| 45:2I:1204:VAL:O   | 45:2I:1207:LYS:N  | 2.37                     | 0.57              |
| 1:A:20:U:O2        | 37:2A:42:G:N2     | 2.38                     | 0.56              |
| 5:5D:739:ARG:NE    | 5:5D:740:ASP:OD1  | 2.37                     | 0.56              |
| 37:2A:141:C:C2     | 37:2A:142:C:C5    | 2.93                     | 0.56              |
| 43:2G:937:LEU:O    | 43:2G:940:LEU:N   | 2.38                     | 0.56              |
| 45:2I:973:GLY:HA3  | 45:2I:976:LYS:C   | 2.31                     | 0.56              |
| 1:A:31:C:N4        | 1:A:32:C:H41      | 2.03                     | 0.56              |
| 2:5A:81:U:H2'      | 2:5A:81:U:O2      | 2.05                     | 0.56              |
| 2:5A:87:A:C6       | 2:5A:92:U:OP2     | 2.59                     | 0.56              |
| 3:5B:541:GLY:N     | 28:4G:33:ASP:OD2  | 2.38                     | 0.56              |
| 4:5C:693:GLU:HA    | 4:5C:693:GLU:OE2  | 2.05                     | 0.56              |
| 1:A:12:U:H2'       | 1:A:12:U:P        | 2.45                     | 0.56              |
| 3:5B:1660:TYR:OH   | 3:5B:1717:ASN:O   | 2.16                     | 0.56              |
| 37:2A:154:C:O2'    | 37:2A:155:C:H5'   | 2.04                     | 0.56              |
| 42:2F:184:ARG:O    | 7:2a:85:PRO:CA    | 2.53                     | 0.56              |
| 1:A:10:C:O2'       | 1:A:11:C:P        | 2.64                     | 0.56              |
| 2:5A:38:C:O2'      | 32:4K:386:SER:O   | 2.23                     | 0.56              |
| 3:5B:227:ARG:O     | 3:5B:229:GLN:NE2  | 2.39                     | 0.56              |
| 25:4D:177:GLN:N    | 25:4D:177:GLN:OE1 | 2.39                     | 0.56              |
| 2:5A:110:C:H2'     | 2:5A:111:A:H8     | 1.70                     | 0.56              |
| 3:5B:151:MET:SD    | 3:5B:628:GLY:O    | 2.64                     | 0.56              |
| 5:5D:544:MET:HE1   | 22:4A:73:U:H5''   | 1.87                     | 0.56              |
| 45:2I:287:PHE:CA   | 45:2I:304:GLN:O   | 2.53                     | 0.56              |
| 45:2I:931:VAL:O    | 45:2I:935:GLU:N   | 2.39                     | 0.56              |
| 5:5D:470:TYR:O     | 5:5D:562:TYR:OH   | 2.12                     | 0.56              |
| 37:2A:181:G:H2'    | 37:2A:182:U:H6    | 1.71                     | 0.56              |
| 43:2G:968:GLU:O    | 43:2G:971:MET:N   | 2.39                     | 0.56              |
| 3:5B:488:ASP:OD1   | 3:5B:489:TRP:N    | 2.39                     | 0.56              |
| 4:5C:230:ASP:OD1   | 4:5C:233:GLU:N    | 2.32                     | 0.56              |
| 5:5D:1725:GLU:OE1  | 5:5D:1763:ARG:NE  | 2.30                     | 0.56              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 24:4C:189:ALA:O    | 24:4C:193:LEU:HD12 | 2.06                     | 0.56              |
| 45:2I:42:ARG:N     | 45:2I:51:HIS:O     | 2.32                     | 0.56              |
| 47:2K:98:PHE:O     | 47:2K:100:LYS:N    | 2.39                     | 0.56              |
| 24:4C:363:GLY:O    | 24:4C:390:ARG:NH2  | 2.39                     | 0.56              |
| 26:4E:24:ASP:OD2   | 26:4E:28:GLN:NE2   | 2.38                     | 0.56              |
| 1:A:36:C:O2'       | 1:A:37:C:OP1       | 2.24                     | 0.55              |
| 2:5A:67:A:HO2'     | 2:5A:68:C:P        | 2.25                     | 0.55              |
| 5:5D:774:LEU:HD21  | 5:5D:778:LEU:HD11  | 1.88                     | 0.55              |
| 5:5D:1058:LYS:NZ   | 5:5D:1080:ASP:OD2  | 2.27                     | 0.55              |
| 37:2A:149:A:H2'    | 37:2A:150:U:H6     | 1.70                     | 0.55              |
| 1:A:21:U:C1'       | 1:A:22:C:P         | 2.94                     | 0.55              |
| 5:5D:1402:ASN:O    | 5:5D:1402:ASN:ND2  | 2.37                     | 0.55              |
| 22:4A:113:C:O5'    | 22:4A:113:C:H6     | 1.88                     | 0.55              |
| 43:2G:1124:SER:O   | 43:2G:1127:THR:N   | 2.34                     | 0.55              |
| 4:5C:140:HIS:N     | 51:5C:1500:GTP:O2B | 2.38                     | 0.55              |
| 5:5D:1078:MET:HE1  | 5:5D:1082:VAL:HG23 | 1.88                     | 0.55              |
| 5:5D:1092:MET:HE3  | 5:5D:1092:MET:O    | 2.07                     | 0.55              |
| 19:6e:46:GLU:CA    | 19:6e:62:ASP:CA    | 2.85                     | 0.55              |
| 35:4N:83:ASN:OD1   | 35:4N:84:VAL:N     | 2.39                     | 0.55              |
| 40:2D:174:VAL:O    | 40:2D:178:GLY:HA2  | 2.05                     | 0.55              |
| 1:A:34:G:C2'       | 1:A:35:U:C6        | 2.88                     | 0.55              |
| 5:5D:877:GLN:OE1   | 5:5D:877:GLN:N     | 2.40                     | 0.55              |
| 5:5D:1535:THR:HG21 | 5:5D:1676:TYR:CE2  | 2.42                     | 0.55              |
| 45:2I:303:ALA:O    | 45:2I:310:ILE:CA   | 2.55                     | 0.55              |
| 1:A:31:C:N3        | 37:2A:33:G:O6      | 2.40                     | 0.55              |
| 1:A:36:C:O2'       | 1:A:36:C:O2        | 2.24                     | 0.55              |
| 2:5A:110:C:H2'     | 2:5A:111:A:C8      | 2.42                     | 0.55              |
| 4:5C:516:LEU:HD13  | 4:5C:575:GLN:OE1   | 2.06                     | 0.55              |
| 5:5D:1186:LEU:HD21 | 5:5D:1270:VAL:CG2  | 2.36                     | 0.55              |
| 5:5D:1636:PHE:HD2  | 5:5D:1656:VAL:HG21 | 1.70                     | 0.55              |
| 5:5D:1943:MET:HE1  | 5:5D:2065:TRP:CB   | 2.37                     | 0.55              |
| 33:4L:120:LEU:HB3  | 33:4L:152:LEU:HD11 | 1.89                     | 0.55              |
| 37:2A:183:G:C4     | 37:2A:184:C:C5     | 2.94                     | 0.55              |
| 43:2G:747:LEU:O    | 43:2G:748:LYS:C    | 2.48                     | 0.55              |
| 47:2K:109:GLN:O    | 47:2K:112:LEU:N    | 2.39                     | 0.55              |
| 1:A:36:C:C1'       | 1:A:37:C:P         | 2.94                     | 0.55              |
| 2:5A:117:A:C2      | 10:5d:26:GLY:HA3   | 2.41                     | 0.55              |
| 5:5D:475:PHE:HE1   | 5:5D:514:LEU:HD23  | 1.72                     | 0.55              |
| 37:2A:141:C:H2'    | 37:2A:142:C:H6     | 1.71                     | 0.55              |
| 37:2A:150:U:C2     | 37:2A:151:C:C5     | 2.94                     | 0.55              |
| 37:2A:150:U:H2'    | 37:2A:151:C:H6     | 1.71                     | 0.55              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 43:2G:874:LYS:O    | 43:2G:877:GLY:CA   | 2.54                     | 0.55              |
| 45:2I:1195:GLU:C   | 45:2I:1198:ASP:H   | 2.14                     | 0.55              |
| 5:5D:1802:ILE:HD12 | 5:5D:1810:VAL:CG1  | 2.36                     | 0.55              |
| 27:4F:110:GLN:NE2  | 27:4F:114:ASP:OD1  | 2.40                     | 0.55              |
| 43:2G:578:ILE:O    | 43:2G:581:LEU:N    | 2.39                     | 0.55              |
| 3:5B:180:ASP:OD1   | 3:5B:180:ASP:C     | 2.50                     | 0.55              |
| 5:5D:2037:VAL:HG13 | 5:5D:2092:LEU:CD2  | 2.37                     | 0.55              |
| 5:5D:1029:VAL:HG13 | 5:5D:1029:VAL:O    | 2.07                     | 0.55              |
| 22:4A:73:U:O2'     | 22:4A:74:C:OP2     | 2.22                     | 0.55              |
| 22:4A:108:C:H2'    | 22:4A:109:G:C8     | 2.41                     | 0.55              |
| 37:2A:149:A:C4     | 37:2A:150:U:C5     | 2.95                     | 0.55              |
| 37:2A:183:G:H2'    | 37:2A:184:C:H6     | 1.71                     | 0.55              |
| 43:2G:86:ALA:C     | 43:2G:89:ALA:H     | 2.11                     | 0.55              |
| 43:2G:557:ASP:O    | 43:2G:560:LEU:N    | 2.40                     | 0.55              |
| 5:5D:1854:GLU:N    | 5:5D:1854:GLU:OE1  | 2.40                     | 0.54              |
| 5:5D:1970:HIS:CE1  | 5:5D:1997:LEU:HD13 | 2.41                     | 0.54              |
| 37:2A:147:G:C4     | 37:2A:148:C:C5     | 2.95                     | 0.54              |
| 5:5D:2098:ALA:O    | 5:5D:2099:THR:HG22 | 2.06                     | 0.54              |
| 43:2G:699:GLN:O    | 43:2G:700:LYS:C    | 2.48                     | 0.54              |
| 43:2G:849:ILE:O    | 43:2G:852:ARG:N    | 2.38                     | 0.54              |
| 5:5D:2037:VAL:HG13 | 5:5D:2092:LEU:HD21 | 1.90                     | 0.54              |
| 43:2G:517:ARG:O    | 43:2G:520:THR:N    | 2.41                     | 0.54              |
| 43:2G:641:ILE:O    | 43:2G:644:LEU:N    | 2.40                     | 0.54              |
| 45:2I:488:GLY:C    | 45:2I:490:THR:H    | 2.14                     | 0.54              |
| 1:A:34:G:C3'       | 1:A:35:U:H5''      | 2.35                     | 0.54              |
| 3:5B:1305:SER:O    | 3:5B:1305:SER:OG   | 2.18                     | 0.54              |
| 4:5C:117:ASP:O     | 4:5C:121:ASP:OD1   | 2.26                     | 0.54              |
| 5:5D:687:GLN:OE1   | 5:5D:689:TYR:OH    | 2.24                     | 0.54              |
| 36:4Z:330:THR:HA   | 36:4Z:346:ARG:HA   | 1.88                     | 0.54              |
| 43:2G:1205:GLU:O   | 43:2G:1208:LEU:N   | 2.41                     | 0.54              |
| 45:2I:785:PRO:CA   | 45:2I:800:ILE:O    | 2.56                     | 0.54              |
| 1:A:31:C:C2        | 37:2A:33:G:C2      | 2.95                     | 0.54              |
| 4:5C:938:ARG:O     | 4:5C:942:GLY:N     | 2.41                     | 0.54              |
| 19:6e:46:GLU:H     | 19:6e:63:ALA:CA    | 2.21                     | 0.54              |
| 37:2A:181:G:C4     | 37:2A:182:U:C5     | 2.95                     | 0.54              |
| 5:5D:1425:ILE:N    | 5:5D:1425:ILE:HD12 | 2.22                     | 0.54              |
| 25:4D:311:SER:O    | 25:4D:311:SER:OG   | 2.24                     | 0.54              |
| 37:2A:179:C:H2'    | 37:2A:180:G:C8     | 2.39                     | 0.54              |
| 3:5B:2135:ASP:CG   | 3:5B:2135:ASP:O    | 2.50                     | 0.54              |
| 5:5D:1405:VAL:HG23 | 5:5D:1424:ILE:HB   | 1.89                     | 0.54              |
| 14:6A:57:U:C2      | 14:6A:58:G:C8      | 2.95                     | 0.54              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 29:4H:110:LEU:O    | 29:4H:141:PHE:N    | 2.41                     | 0.54              |
| 3:5B:1545:ALA:HB2  | 3:5B:1563:HIS:CD2  | 2.43                     | 0.54              |
| 4:5C:354:ARG:O     | 4:5C:354:ARG:HG3   | 2.08                     | 0.54              |
| 4:5C:377:LEU:HD21  | 4:5C:424:PHE:HZ    | 1.73                     | 0.54              |
| 5:5D:615:ASP:OD1   | 5:5D:616:GLU:N     | 2.41                     | 0.54              |
| 5:5D:1074:GLY:HA3  | 35:4N:71:THR:HG23  | 1.90                     | 0.54              |
| 24:4C:417:PRO:HG3  | 24:4C:459:PRO:O    | 2.07                     | 0.54              |
| 22:4A:119:A:H5''   | 10:4d:39:TYR:N     | 2.23                     | 0.54              |
| 4:5C:520:GLU:N     | 4:5C:520:GLU:OE1   | 2.38                     | 0.54              |
| 5:5D:1139:VAL:HG21 | 5:5D:1174:ILE:HD11 | 1.89                     | 0.54              |
| 22:4A:61:A:H2'     | 22:4A:62:U:O4'     | 2.08                     | 0.54              |
| 37:2A:147:G:H2'    | 37:2A:148:C:C6     | 2.43                     | 0.54              |
| 5:5D:713:MET:HE3   | 5:5D:713:MET:HA    | 1.89                     | 0.53              |
| 28:4G:97:ASP:OD1   | 28:4G:97:ASP:N     | 2.41                     | 0.53              |
| 45:2I:589:CYS:O    | 45:2I:608:GLY:N    | 2.30                     | 0.53              |
| 5:5D:1986:MET:O    | 5:5D:1993:ARG:NH2  | 2.41                     | 0.53              |
| 37:2A:153:A:H3'    | 37:2A:154:C:C5'    | 2.37                     | 0.53              |
| 43:2G:1026:ASN:O   | 43:2G:1028:HIS:N   | 2.41                     | 0.53              |
| 2:5A:67:A:O2'      | 2:5A:68:C:P        | 2.66                     | 0.53              |
| 4:5C:825:PRO:HG2   | 4:5C:912:LEU:HD11  | 1.90                     | 0.53              |
| 5:5D:1736:PHE:HE1  | 5:5D:1751:ALA:HB1  | 1.73                     | 0.53              |
| 37:2A:153:A:C3'    | 37:2A:154:C:C5'    | 2.85                     | 0.53              |
| 43:2G:1132:LEU:O   | 43:2G:1135:GLU:N   | 2.41                     | 0.53              |
| 1:A:10:C:HO2'      | 1:A:11:C:P         | 2.32                     | 0.53              |
| 3:5B:519:ASP:OD1   | 3:5B:519:ASP:C     | 2.52                     | 0.53              |
| 24:4C:356:GLU:OE2  | 24:4C:356:GLU:N    | 2.41                     | 0.53              |
| 28:4G:651:LEU:O    | 28:4G:655:ASN:N    | 2.42                     | 0.53              |
| 43:2G:663:THR:O    | 43:2G:666:LYS:N    | 2.42                     | 0.53              |
| 1:A:15:A:O2'       | 1:A:16:A:H5'       | 2.09                     | 0.53              |
| 2:5A:99:C:H2'      | 2:5A:100:C:C6      | 2.43                     | 0.53              |
| 2:5A:108:G:H3'     | 2:5A:109:G:H8      | 1.73                     | 0.53              |
| 3:5B:2046:THR:OG1  | 3:5B:2047:VAL:N    | 2.40                     | 0.53              |
| 30:4I:8:GLN:HE21   | 30:4I:8:GLN:CA     | 2.16                     | 0.53              |
| 23:4B:480:ASN:OD1  | 23:4B:484:VAL:HG23 | 2.08                     | 0.53              |
| 3:5B:744:LYS:O     | 3:5B:748:ASP:OD1   | 2.27                     | 0.53              |
| 5:5D:1886:ASP:OD1  | 5:5D:1888:HIS:ND1  | 2.40                     | 0.53              |
| 24:4C:290:ASP:N    | 24:4C:290:ASP:OD1  | 2.41                     | 0.53              |
| 28:4G:771:LEU:C    | 28:4G:771:LEU:HD23 | 2.34                     | 0.53              |
| 43:2G:1280:LEU:O   | 43:2G:1282:ALA:N   | 2.42                     | 0.53              |
| 3:5B:75:ASP:OD1    | 3:5B:75:ASP:N      | 2.41                     | 0.53              |
| 1:A:22:C:C2'       | 1:A:23:G:C5'       | 2.87                     | 0.53              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 4:5C:227:LEU:HD22  | 4:5C:243:ILE:CG2   | 2.38                     | 0.53              |
| 5:5D:1157:ASN:OD1  | 5:5D:1159:ASN:N    | 2.41                     | 0.53              |
| 25:4D:89:GLU:OE1   | 25:4D:211:ARG:NH1  | 2.42                     | 0.53              |
| 33:4L:134:ASN:ND2  | 33:4L:140:GLU:OE2  | 2.41                     | 0.53              |
| 37:2A:54:U:P       | 42:2F:424:ARG:O    | 2.67                     | 0.53              |
| 45:2I:1195:GLU:O   | 45:2I:1198:ASP:N   | 2.41                     | 0.53              |
| 5:5D:1143:ILE:CD1  | 5:5D:1165:ILE:HD12 | 2.39                     | 0.53              |
| 16:6b:47:ASP:O     | 16:6b:50:LEU:N     | 2.39                     | 0.53              |
| 16:6b:48:GLN:C     | 16:6b:50:LEU:H     | 2.14                     | 0.53              |
| 23:4B:646:MET:HE2  | 23:4B:646:MET:HA   | 1.90                     | 0.53              |
| 32:4K:341:TYR:O    | 34:4M:15:ARG:NH2   | 2.41                     | 0.53              |
| 28:4G:707:ASP:HA   | 28:4G:708:PHE:C    | 2.33                     | 0.52              |
| 43:2G:244:THR:O    | 43:2G:247:ALA:N    | 2.43                     | 0.52              |
| 1:A:41:U:H2'       | 1:A:41:U:O2        | 2.09                     | 0.52              |
| 3:5B:439:GLN:O     | 3:5B:444:ARG:NH1   | 2.41                     | 0.52              |
| 4:5C:713:LYS:O     | 4:5C:713:LYS:HD3   | 2.09                     | 0.52              |
| 5:5D:890:GLU:OE2   | 5:5D:928:ARG:NH2   | 2.43                     | 0.52              |
| 33:4L:4:ARG:O      | 33:4L:79:GLN:NE2   | 2.38                     | 0.52              |
| 4:5C:209:VAL:O     | 4:5C:212:SER:OG    | 2.25                     | 0.52              |
| 23:4B:385:PRO:HG2  | 24:4C:437:ARG:NH1  | 2.25                     | 0.52              |
| 43:2G:1025:LYS:O   | 43:2G:1027:ARG:N   | 2.42                     | 0.52              |
| 2:5A:95:G:N3       | 2:5A:95:G:C2'      | 2.73                     | 0.52              |
| 3:5B:832:TYR:OH    | 3:5B:929:GLU:OE2   | 2.25                     | 0.52              |
| 5:5D:471:ALA:CB    | 5:5D:518:LEU:HD13  | 2.35                     | 0.52              |
| 5:5D:785:HIS:HB3   | 5:5D:809:LEU:HD21  | 1.91                     | 0.52              |
| 5:5D:824:HIS:ND1   | 5:5D:862:ASP:OD1   | 2.36                     | 0.52              |
| 43:2G:978:LEU:O    | 43:2G:979:TYR:C    | 2.51                     | 0.52              |
| 49:2M:36:HIS:O     | 49:2M:37:ARG:C     | 2.53                     | 0.52              |
| 1:A:36:C:C5'       | 1:A:37:C:C5        | 2.91                     | 0.52              |
| 1:A:38:C:O2        | 1:A:38:C:H2'       | 2.08                     | 0.52              |
| 22:4A:118:A:H8     | 22:4A:118:A:OP2    | 1.92                     | 0.52              |
| 36:4Z:425:MET:HA   | 36:4Z:431:ILE:HA   | 1.92                     | 0.52              |
| 43:2G:841:ALA:O    | 43:2G:843:LYS:N    | 2.41                     | 0.52              |
| 24:4C:393:ASP:O    | 24:4C:397:GLY:N    | 2.42                     | 0.52              |
| 2:5A:87:A:H61      | 2:5A:92:U:P        | 2.32                     | 0.52              |
| 5:5D:1320:LEU:HD22 | 5:5D:1396:LYS:HG2  | 1.91                     | 0.52              |
| 5:5D:1735:HIS:O    | 5:5D:1739:GLU:HG3  | 2.10                     | 0.52              |
| 5:5D:933:PRO:HG3   | 5:5D:943:LEU:HD12  | 1.91                     | 0.52              |
| 23:4B:417:LEU:HD12 | 23:4B:417:LEU:O    | 2.10                     | 0.52              |
| 29:4H:66:HIS:N     | 29:4H:75:GLN:O     | 2.42                     | 0.52              |
| 42:2F:411:CYS:O    | 42:2F:414:TYR:N    | 2.37                     | 0.52              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 43:2G:407:MET:CA   | 43:2G:407:MET:H    | 2.06                     | 0.52              |
| 43:2G:423:PRO:O    | 43:2G:427:PRO:N    | 2.43                     | 0.52              |
| 43:2G:1280:LEU:O   | 43:2G:1281:ILE:C   | 2.51                     | 0.52              |
| 3:5B:2183:ASN:OD1  | 3:5B:2183:ASN:C    | 2.52                     | 0.52              |
| 5:5D:1001:TYR:OH   | 5:5D:1091:LEU:HD12 | 2.09                     | 0.52              |
| 43:2G:1207:SER:O   | 43:2G:1210:HIS:N   | 2.43                     | 0.52              |
| 23:4B:570:THR:HG22 | 23:4B:571:GLY:N    | 2.25                     | 0.52              |
| 37:2A:107:A:C6     | 37:2A:108:G:C5     | 2.98                     | 0.52              |
| 3:5B:248:ASP:N     | 3:5B:248:ASP:OD1   | 2.43                     | 0.51              |
| 3:5B:1957:ASP:OD1  | 3:5B:1958:LYS:N    | 2.42                     | 0.51              |
| 24:4C:259:SER:O    | 24:4C:263:CYS:N    | 2.43                     | 0.51              |
| 3:5B:2184:GLU:OE1  | 3:5B:2217:SER:CB   | 2.59                     | 0.51              |
| 4:5C:141:GLY:N     | 51:5C:1500:GTP:O2B | 2.33                     | 0.51              |
| 5:5D:1127:CYS:SG   | 5:5D:1143:ILE:HG21 | 2.50                     | 0.51              |
| 23:4B:674:LEU:O    | 23:4B:677:SER:OG   | 2.23                     | 0.51              |
| 33:4L:82:PRO:HG2   | 33:4L:87:ILE:HD11  | 1.91                     | 0.51              |
| 43:2G:1109:ARG:O   | 43:2G:1111:CYS:N   | 2.43                     | 0.51              |
| 2:5A:50:G:O2'      | 2:5A:51:A:H5'      | 2.10                     | 0.51              |
| 5:5D:597:THR:HG21  | 5:5D:634:ARG:HD2   | 1.91                     | 0.51              |
| 5:5D:734:THR:HG23  | 5:5D:810:VAL:HG11  | 1.93                     | 0.51              |
| 5:5D:1617:VAL:HG12 | 5:5D:1643:VAL:HB   | 1.93                     | 0.51              |
| 5:5D:2084:LEU:HD23 | 5:5D:2084:LEU:H    | 1.76                     | 0.51              |
| 43:2G:1129:LEU:O   | 43:2G:1132:LEU:N   | 2.44                     | 0.51              |
| 45:2I:673:VAL:CA   | 45:2I:691:THR:H    | 2.24                     | 0.51              |
| 4:5C:340:ALA:HA    | 4:5C:343:LEU:HD12  | 1.92                     | 0.51              |
| 5:5D:1819:ALA:HB2  | 5:5D:1829:ILE:HG21 | 1.91                     | 0.51              |
| 22:4A:120:U:O2'    | 11:4e:82:ASP:CA    | 2.58                     | 0.51              |
| 33:4L:94:GLU:O     | 33:4L:94:GLU:OE1   | 2.28                     | 0.51              |
| 33:4L:130:ILE:HD11 | 33:4L:142:MET:HB3  | 1.92                     | 0.51              |
| 43:2G:720:GLY:O    | 43:2G:721:ILE:C    | 2.54                     | 0.51              |
| 43:2G:1094:LEU:O   | 43:2G:1098:LEU:N   | 2.41                     | 0.51              |
| 43:2G:1110:VAL:O   | 43:2G:1113:THR:N   | 2.43                     | 0.51              |
| 2:5A:96:A:N6       | 12:5f:23:GLY:N     | 2.58                     | 0.51              |
| 4:5C:776:GLU:OE1   | 4:5C:776:GLU:HA    | 2.09                     | 0.51              |
| 5:5D:1433:ASP:OD1  | 5:5D:1473:ARG:NH2  | 2.43                     | 0.51              |
| 5:5D:1837:ASN:OD1  | 5:5D:1840:THR:N    | 2.43                     | 0.51              |
| 37:2A:111:G:O3'    | 37:2A:112:G:O4'    | 2.29                     | 0.51              |
| 43:2G:103:PRO:C    | 43:2G:106:GLU:H    | 2.18                     | 0.51              |
| 3:5B:353:ASP:OD1   | 3:5B:353:ASP:N     | 2.44                     | 0.51              |
| 3:5B:651:TRP:CZ3   | 3:5B:652:LEU:HD23  | 2.45                     | 0.51              |
| 5:5D:1295:TYR:OH   | 5:5D:1763:ARG:NH1  | 2.43                     | 0.51              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 5:5D:1931:SER:HA   | 5:5D:2076:LEU:HD23 | 1.93                     | 0.51              |
| 23:4B:579:VAL:HG23 | 23:4B:579:VAL:O    | 2.11                     | 0.51              |
| 28:4G:891:GLU:CD   | 28:4G:891:GLU:H    | 2.19                     | 0.51              |
| 1:A:36:C:C1'       | 1:A:37:C:OP1       | 2.55                     | 0.51              |
| 2:5A:67:A:H2'      | 2:5A:68:C:C5       | 2.46                     | 0.51              |
| 5:5D:1277:SER:O    | 5:5D:1277:SER:OG   | 2.28                     | 0.51              |
| 45:2I:546:LYS:O    | 45:2I:556:ILE:CA   | 2.58                     | 0.51              |
| 3:5B:310:THR:HG22  | 3:5B:314:ILE:HD12  | 1.92                     | 0.51              |
| 45:2I:699:VAL:CA   | 45:2I:715:MET:O    | 2.59                     | 0.51              |
| 2:5A:85:C:OP1      | 9:5c:20:GLU:N      | 2.44                     | 0.51              |
| 3:5B:1901:LYS:NZ   | 3:5B:1966:HIS:O    | 2.36                     | 0.51              |
| 5:5D:1301:LEU:HD11 | 5:5D:1518:VAL:HG13 | 1.93                     | 0.51              |
| 5:5D:1943:MET:HE1  | 5:5D:2065:TRP:CG   | 2.45                     | 0.51              |
| 22:4A:111:C:H2'    | 22:4A:112:A:C8     | 2.46                     | 0.51              |
| 4:5C:173:THR:N     | 4:5C:176:GLU:OE1   | 2.44                     | 0.51              |
| 4:5C:809:ILE:HG13  | 4:5C:810:PRO:HD3   | 1.92                     | 0.51              |
| 5:5D:1222:TRP:NE1  | 5:5D:1273:ASP:OD1  | 2.36                     | 0.51              |
| 5:5D:1622:GLU:N    | 5:5D:1622:GLU:OE1  | 2.44                     | 0.51              |
| 43:2G:528:ALA:O    | 43:2G:531:LEU:N    | 2.44                     | 0.51              |
| 47:2K:46:ARG:N     | 47:2K:63:VAL:O     | 2.44                     | 0.51              |
| 49:2M:37:ARG:O     | 49:2M:40:TYR:N     | 2.44                     | 0.51              |
| 1:A:31:C:H2'       | 1:A:32:C:H5'       | 1.91                     | 0.50              |
| 3:5B:678:GLU:HA    | 3:5B:749:TRP:HZ2   | 1.76                     | 0.50              |
| 4:5C:778:PRO:HD3   | 4:5C:784:ILE:HD11  | 1.91                     | 0.50              |
| 31:4J:184:LEU:HD12 | 31:4J:184:LEU:C    | 2.36                     | 0.50              |
| 37:2A:164:C:H5'    | 37:2A:164:C:C6     | 2.44                     | 0.50              |
| 43:2G:629:ALA:O    | 43:2G:632:PHE:N    | 2.45                     | 0.50              |
| 2:5A:98:G:H2'      | 2:5A:99:C:C6       | 2.47                     | 0.50              |
| 5:5D:570:THR:HG23  | 5:5D:572:ASP:H     | 1.76                     | 0.50              |
| 25:4D:102:GLU:OE2  | 25:4D:102:GLU:C    | 2.55                     | 0.50              |
| 5:5D:565:THR:O     | 5:5D:583:THR:OG1   | 2.26                     | 0.50              |
| 14:6A:58:G:C2      | 14:6A:59:G:C8      | 2.99                     | 0.50              |
| 24:4C:458:GLU:HG2  | 24:4C:459:PRO:HD2  | 1.93                     | 0.50              |
| 43:2G:804:ASN:O    | 43:2G:807:LYS:N    | 2.44                     | 0.50              |
| 43:2G:1243:PRO:O   | 43:2G:1244:CYS:C   | 2.55                     | 0.50              |
| 5:5D:1345:ASN:OD1  | 5:5D:1487:ILE:HD12 | 2.11                     | 0.50              |
| 7:4a:18:ARG:N      | 7:4a:81:THR:O      | 2.40                     | 0.50              |
| 43:2G:771:LEU:O    | 43:2G:774:ILE:N    | 2.43                     | 0.50              |
| 43:2G:939:ARG:O    | 43:2G:940:LEU:C    | 2.51                     | 0.50              |
| 1:A:40:U:HO2'      | 1:A:41:U:P         | 2.24                     | 0.50              |
| 24:4C:230:ASP:OD1  | 24:4C:231:ASP:N    | 2.42                     | 0.50              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 43:2G:862:GLU:O    | 43:2G:863:GLN:C    | 2.55                     | 0.50              |
| 43:2G:892:LEU:O    | 43:2G:893:ILE:C    | 2.54                     | 0.50              |
| 1:A:34:G:H21       | 1:A:35:U:H5'       | 1.77                     | 0.50              |
| 1:A:37:C:H3'       | 1:A:37:C:H6        | 1.75                     | 0.50              |
| 2:5A:100:C:H2'     | 2:5A:101:U:C6      | 2.46                     | 0.50              |
| 5:5D:1947:GLN:NE2  | 5:5D:2114:MET:SD   | 2.85                     | 0.50              |
| 43:2G:963:LYS:O    | 43:2G:966:GLN:N    | 2.30                     | 0.50              |
| 43:2G:1035:CYS:O   | 43:2G:1038:LEU:N   | 2.44                     | 0.50              |
| 43:2G:1188:ALA:O   | 43:2G:1191:VAL:N   | 2.45                     | 0.50              |
| 5:5D:781:GLY:O     | 5:5D:806:ILE:HG23  | 2.11                     | 0.50              |
| 5:5D:1767:ASN:OD1  | 5:5D:1770:TYR:HB2  | 2.12                     | 0.50              |
| 5:5D:1899:LEU:HD22 | 5:5D:1948:MET:HG3  | 1.93                     | 0.50              |
| 43:2G:1268:ILE:O   | 43:2G:1271:SER:N   | 2.44                     | 0.50              |
| 1:A:25:G:H1        | 37:2A:37:U:H3      | 1.60                     | 0.50              |
| 1:A:34:G:C2'       | 1:A:35:U:H6        | 2.23                     | 0.50              |
| 1:A:102:U:N3       | 3:5B:587:GLN:OE1   | 2.44                     | 0.50              |
| 2:5A:73:C:H2'      | 2:5A:74:U:C6       | 2.47                     | 0.50              |
| 3:5B:1010:THR:HG22 | 25:4D:261:GLY:O    | 2.12                     | 0.50              |
| 5:5D:1092:MET:HE3  | 5:5D:1092:MET:HA   | 1.93                     | 0.50              |
| 28:4G:634:ALA:O    | 28:4G:638:ASN:N    | 2.40                     | 0.50              |
| 22:4A:143:U:H2'    | 22:4A:144:G:H5''   | 1.92                     | 0.50              |
| 28:4G:739:CYS:HB3  | 28:4G:740:PRO:HA   | 1.94                     | 0.50              |
| 28:4G:744:PRO:O    | 28:4G:748:LEU:HD23 | 2.11                     | 0.50              |
| 3:5B:411:PHE:CD1   | 3:5B:411:PHE:N     | 2.76                     | 0.49              |
| 3:5B:1091:TYR:O    | 3:5B:1092:ILE:C    | 2.54                     | 0.49              |
| 5:5D:1092:MET:HE3  | 5:5D:1092:MET:CA   | 2.41                     | 0.49              |
| 11:5e:15:VAL:O     | 12:5f:33:GLY:HA3   | 2.12                     | 0.49              |
| 22:4A:120:U:H3'    | 22:4A:120:U:H6     | 1.77                     | 0.49              |
| 30:4I:14:ASP:OD1   | 30:4I:14:ASP:C     | 2.55                     | 0.49              |
| 43:2G:708:ALA:O    | 43:2G:709:ILE:C    | 2.54                     | 0.49              |
| 43:2G:1080:THR:O   | 43:2G:1083:TYR:N   | 2.44                     | 0.49              |
| 1:A:37:C:O2'       | 1:A:38:C:O5'       | 2.30                     | 0.49              |
| 1:A:116:G:N2       | 14:6A:38:G:H22     | 2.10                     | 0.49              |
| 5:5D:534:ASP:O     | 5:5D:534:ASP:OD1   | 2.30                     | 0.49              |
| 5:5D:1609:LEU:C    | 5:5D:1609:LEU:HD23 | 2.37                     | 0.49              |
| 23:4B:543:ILE:HD11 | 23:4B:638:ALA:HB3  | 1.94                     | 0.49              |
| 24:4C:404:GLU:N    | 24:4C:404:GLU:OE1  | 2.45                     | 0.49              |
| 33:4L:49:ASP:OD1   | 33:4L:49:ASP:C     | 2.55                     | 0.49              |
| 37:2A:30:A:N3      | 37:2A:30:A:C2'     | 2.73                     | 0.49              |
| 43:2G:501:LEU:O    | 43:2G:502:LEU:C    | 2.55                     | 0.49              |
| 43:2G:665:ILE:O    | 43:2G:666:LYS:C    | 2.56                     | 0.49              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 43:2G:974:LEU:O   | 43:2G:975:GLY:C   | 2.54                     | 0.49              |
| 45:2I:1194:SER:O  | 45:2I:1199:ARG:N  | 2.35                     | 0.49              |
| 3:5B:352:PHE:CD1  | 4:5C:269:LEU:HD22 | 2.47                     | 0.49              |
| 25:4D:282:SER:O   | 25:4D:282:SER:OG  | 2.30                     | 0.49              |
| 4:5C:845:ALA:O    | 4:5C:848:THR:HG22 | 2.13                     | 0.49              |
| 5:5D:1411:GLU:OE2 | 5:5D:1413:SER:OG  | 2.21                     | 0.49              |
| 24:4C:195:GLU:OE2 | 24:4C:195:GLU:O   | 2.30                     | 0.49              |
| 5:5D:642:THR:HG21 | 5:5D:644:GLU:OE2  | 2.12                     | 0.49              |
| 16:6b:48:GLN:C    | 16:6b:50:LEU:N    | 2.69                     | 0.49              |
| 37:2A:107:A:C2    | 37:2A:108:G:C4    | 3.01                     | 0.49              |
| 43:2G:693:GLY:O   | 43:2G:694:LEU:C   | 2.55                     | 0.49              |
| 43:2G:833:LEU:O   | 43:2G:834:VAL:C   | 2.56                     | 0.49              |
| 45:2I:596:PRO:O   | 45:2I:598:GLY:N   | 2.46                     | 0.49              |
| 3:5B:1638:ASN:OD1 | 3:5B:1652:MET:O   | 2.31                     | 0.49              |
| 5:5D:1624:LEU:O   | 5:5D:1629:ARG:NH1 | 2.46                     | 0.49              |
| 5:5D:1830:GLU:OE2 | 5:5D:1830:GLU:HA  | 2.12                     | 0.49              |
| 22:4A:138:G:OP2   | 13:4g:24:THR:O    | 2.31                     | 0.49              |
| 11:2e:15:VAL:O    | 12:2f:33:GLY:HA3  | 2.12                     | 0.49              |
| 2:5A:115:C:OP1    | 11:5e:67:LYS:O    | 2.30                     | 0.49              |
| 5:5D:815:LEU:HD23 | 5:5D:815:LEU:O    | 2.12                     | 0.49              |
| 43:2G:553:VAL:O   | 43:2G:556:ILE:N   | 2.46                     | 0.49              |
| 2:5A:98:G:H2'     | 2:5A:99:C:H6      | 1.77                     | 0.49              |
| 5:5D:1462:GLU:O   | 5:5D:1463:ASN:OD1 | 2.31                     | 0.49              |
| 5:5D:1628:GLU:CD  | 5:5D:1628:GLU:H   | 2.20                     | 0.49              |
| 5:5D:2043:ARG:NE  | 5:5D:2045:GLU:O   | 2.44                     | 0.49              |
| 43:2G:849:ILE:O   | 43:2G:850:ILE:C   | 2.54                     | 0.49              |
| 49:2M:48:ASP:O    | 49:2M:49:LEU:C    | 2.54                     | 0.49              |
| 1:A:31:C:C2       | 1:A:32:C:H5       | 2.30                     | 0.49              |
| 3:5B:955:TRP:CZ3  | 3:5B:976:MET:HE1  | 2.48                     | 0.49              |
| 4:5C:237:LEU:O    | 4:5C:240:GLU:HG2  | 2.13                     | 0.49              |
| 4:5C:423:PHE:CD1  | 4:5C:423:PHE:C    | 2.88                     | 0.49              |
| 4:5C:765:SER:HB2  | 4:5C:808:ILE:HG21 | 1.94                     | 0.49              |
| 5:5D:877:GLN:HA   | 5:5D:880:LEU:HD12 | 1.95                     | 0.49              |
| 43:2G:793:LYS:O   | 43:2G:797:GLY:CA  | 2.54                     | 0.49              |
| 3:5B:347:LEU:HD23 | 3:5B:348:PRO:HD2  | 1.95                     | 0.49              |
| 3:5B:2275:ALA:HB2 | 3:5B:2297:GLN:HB2 | 1.95                     | 0.49              |
| 5:5D:694:GLU:O    | 5:5D:700:ARG:NH2  | 2.46                     | 0.49              |
| 6:5E:255:MET:C    | 6:5E:257:ASN:H    | 2.21                     | 0.49              |
| 37:2A:143:A:N3    | 37:2A:143:A:C3'   | 2.73                     | 0.49              |
| 43:2G:177:LYS:O   | 43:2G:180:GLU:N   | 2.46                     | 0.49              |
| 43:2G:663:THR:O   | 43:2G:664:GLY:C   | 2.56                     | 0.49              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 45:2I:430:GLY:O    | 45:2I:433:SER:N    | 2.31                     | 0.49              |
| 3:5B:171:ASP:OD1   | 3:5B:171:ASP:N     | 2.41                     | 0.48              |
| 3:5B:2111:LEU:HD21 | 3:5B:2225:LEU:HD11 | 1.95                     | 0.48              |
| 5:5D:995:ASN:O     | 5:5D:998:VAL:HG22  | 2.12                     | 0.48              |
| 24:4C:119:ILE:HG23 | 24:4C:120:THR:HG23 | 1.95                     | 0.48              |
| 43:2G:1227:ILE:O   | 43:2G:1230:VAL:N   | 2.46                     | 0.48              |
| 2:5A:92:U:H3'      | 2:5A:92:U:H6       | 1.77                     | 0.48              |
| 5:5D:1946:ALA:O    | 5:5D:1949:VAL:HG12 | 2.14                     | 0.48              |
| 14:6A:35:A:H2'     | 14:6A:36:A:C8      | 2.48                     | 0.48              |
| 24:4C:228:ILE:HD13 | 24:4C:515:THR:HG22 | 1.94                     | 0.48              |
| 43:2G:237:GLY:O    | 43:2G:239:ALA:N    | 2.45                     | 0.48              |
| 43:2G:944:SER:O    | 43:2G:946:LYS:N    | 2.38                     | 0.48              |
| 45:2I:930:LEU:C    | 45:2I:934:GLY:HA2  | 2.38                     | 0.48              |
| 3:5B:1019:TYR:O    | 3:5B:1020:LYS:C    | 2.55                     | 0.48              |
| 3:5B:1850:ARG:NH2  | 44:2H:800:MET:O    | 2.41                     | 0.48              |
| 4:5C:125:ASN:OD1   | 4:5C:128:LEU:N     | 2.38                     | 0.48              |
| 5:5D:525:ILE:O     | 5:5D:526:ASN:OD1   | 2.31                     | 0.48              |
| 5:5D:1039:LYS:HA   | 5:5D:1039:LYS:HD3  | 1.44                     | 0.48              |
| 25:4D:98:ASN:OD1   | 25:4D:99:LEU:N     | 2.47                     | 0.48              |
| 43:2G:955:ILE:O    | 43:2G:956:SER:C    | 2.57                     | 0.48              |
| 44:2H:491:LEU:O    | 44:2H:493:ALA:N    | 2.46                     | 0.48              |
| 45:2I:672:GLY:O    | 45:2I:695:GLY:N    | 2.46                     | 0.48              |
| 4:5C:342:ARG:NH2   | 4:5C:356:PHE:O     | 2.46                     | 0.48              |
| 5:5D:938:ILE:HD13  | 5:5D:949:LEU:HD21  | 1.95                     | 0.48              |
| 5:5D:1693:ARG:NH2  | 5:5D:1697:ASP:OD1  | 2.47                     | 0.48              |
| 5:5D:1815:LEU:HD12 | 5:5D:1829:ILE:HG13 | 1.95                     | 0.48              |
| 43:2G:953:ASP:O    | 43:2G:954:LEU:C    | 2.56                     | 0.48              |
| 1:A:34:G:H3'       | 1:A:34:G:N3        | 2.28                     | 0.48              |
| 3:5B:1618:LYS:NZ   | 3:5B:1628:ASP:OD2  | 2.46                     | 0.48              |
| 4:5C:710:ASN:OD1   | 4:5C:713:LYS:HB3   | 2.14                     | 0.48              |
| 33:4L:167:LYS:O    | 33:4L:171:LEU:HD23 | 2.13                     | 0.48              |
| 37:2A:54:U:C5'     | 42:2F:424:ARG:O    | 2.62                     | 0.48              |
| 43:2G:226:HIS:O    | 43:2G:229:SER:N    | 2.46                     | 0.48              |
| 43:2G:625:ARG:O    | 43:2G:628:THR:N    | 2.46                     | 0.48              |
| 43:2G:631:ALA:O    | 43:2G:634:VAL:N    | 2.46                     | 0.48              |
| 3:5B:888:GLN:O     | 3:5B:889:ARG:NH1   | 2.44                     | 0.48              |
| 3:5B:1521:ALA:O    | 3:5B:1524:SER:OG   | 2.26                     | 0.48              |
| 3:5B:2074:ARG:NH2  | 5:5D:1044:VAL:O    | 2.41                     | 0.48              |
| 5:5D:528:ASP:OD1   | 5:5D:528:ASP:N     | 2.45                     | 0.48              |
| 5:5D:1369:LEU:HD23 | 5:5D:1369:LEU:O    | 2.14                     | 0.48              |
| 5:5D:1970:HIS:HE1  | 5:5D:1996:LEU:HD23 | 1.77                     | 0.48              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 28:4G:729:ARG:NH1  | 28:4G:753:GLU:OE1  | 2.46                     | 0.48              |
| 43:2G:994:LEU:O    | 43:2G:995:GLY:C    | 2.56                     | 0.48              |
| 47:2K:98:PHE:C     | 47:2K:100:LYS:N    | 2.72                     | 0.48              |
| 2:5A:78:U:H1'      | 2:5A:79:C:H6       | 1.79                     | 0.48              |
| 3:5B:2184:GLU:OE1  | 3:5B:2217:SER:OG   | 2.26                     | 0.48              |
| 5:5D:1777:SER:OG   | 5:5D:1780:HIS:ND1  | 2.45                     | 0.48              |
| 37:2A:153:A:C2'    | 37:2A:154:C:C5'    | 2.86                     | 0.48              |
| 1:A:17:G:H2'       | 1:A:18:C:H6        | 1.78                     | 0.48              |
| 4:5C:733:TRP:HZ3   | 4:5C:791:ILE:HD12  | 1.79                     | 0.48              |
| 5:5D:1358:ILE:HG22 | 5:5D:1362:PHE:CE1  | 2.48                     | 0.48              |
| 15:6a:61:PHE:N     | 21:6g:70:ILE:O     | 2.45                     | 0.48              |
| 43:2G:667:ILE:O    | 43:2G:668:VAL:C    | 2.53                     | 0.48              |
| 3:5B:1202:THR:HG23 | 3:5B:1204:TYR:CE2  | 2.49                     | 0.48              |
| 3:5B:2128:LEU:HD11 | 3:5B:2214:ILE:HD12 | 1.96                     | 0.48              |
| 4:5C:725:ASP:OD1   | 4:5C:726:LEU:N     | 2.47                     | 0.48              |
| 14:6A:55:C:H2'     | 14:6A:56:A:O4'     | 2.14                     | 0.48              |
| 14:6A:78:A:N3      | 14:6A:78:A:H2'     | 2.29                     | 0.48              |
| 24:4C:242:ASN:C    | 24:4C:242:ASN:OD1  | 2.57                     | 0.48              |
| 43:2G:705:SER:O    | 43:2G:706:ALA:C    | 2.54                     | 0.48              |
| 1:A:38:C:H4'       | 1:A:38:C:OP1       | 2.14                     | 0.48              |
| 2:5A:67:A:C2'      | 2:5A:68:C:OP1      | 2.62                     | 0.48              |
| 3:5B:1528:GLN:OE1  | 3:5B:1528:GLN:HA   | 2.14                     | 0.48              |
| 5:5D:1787:GLU:C    | 5:5D:1787:GLU:OE1  | 2.56                     | 0.48              |
| 24:4C:458:GLU:OE1  | 24:4C:462:GLY:N    | 2.47                     | 0.48              |
| 43:2G:803:ALA:O    | 43:2G:804:ASN:C    | 2.54                     | 0.48              |
| 3:5B:1130:ASN:N    | 3:5B:1130:ASN:OD1  | 2.47                     | 0.47              |
| 5:5D:517:MET:HG2   | 5:5D:538:ILE:HD13  | 1.96                     | 0.47              |
| 5:5D:713:MET:HA    | 5:5D:716:ALA:HB2   | 1.95                     | 0.47              |
| 5:5D:996:ASP:OD1   | 5:5D:997:THR:N     | 2.46                     | 0.47              |
| 5:5D:1039:LYS:HD2  | 5:5D:1043:ARG:NH2  | 2.29                     | 0.47              |
| 5:5D:1625:SER:HB3  | 5:5D:1628:GLU:OE1  | 2.14                     | 0.47              |
| 2:5A:111:A:H2'     | 2:5A:112:A:C8      | 2.49                     | 0.47              |
| 3:5B:933:ARG:O     | 3:5B:935:LEU:N     | 2.48                     | 0.47              |
| 3:5B:1111:GLN:OE1  | 3:5B:1111:GLN:HA   | 2.13                     | 0.47              |
| 4:5C:174:GLU:O     | 4:5C:178:GLY:N     | 2.48                     | 0.47              |
| 4:5C:449:ILE:HD11  | 4:5C:497:LEU:CD1   | 2.44                     | 0.47              |
| 5:5D:641:MET:HG2   | 5:5D:1582:ALA:HB1  | 1.95                     | 0.47              |
| 5:5D:1968:SER:HA   | 5:5D:1971:ILE:HD12 | 1.95                     | 0.47              |
| 22:4A:20:A:H2'     | 22:4A:21:U:C6      | 2.48                     | 0.47              |
| 22:4A:110:G:H2'    | 22:4A:111:C:C6     | 2.49                     | 0.47              |
| 37:2A:151:C:C2     | 37:2A:152:G:N7     | 2.82                     | 0.47              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 1:A:116:G:H1       | 14:6A:38:G:H1      | 1.61                     | 0.47              |
| 5:5D:1739:GLU:OE2  | 5:5D:1754:TYR:CZ   | 2.67                     | 0.47              |
| 36:4Z:499:ILE:N    | 36:4Z:511:TRP:O    | 2.43                     | 0.47              |
| 1:A:28:G:H22       | 37:2A:34:U:H3      | 1.61                     | 0.47              |
| 1:A:116:G:H2'      | 1:A:117:G:C8       | 2.49                     | 0.47              |
| 5:5D:1737:ASN:O    | 5:5D:1740:ILE:HG22 | 2.14                     | 0.47              |
| 5:5D:1740:ILE:HD12 | 5:5D:1745:ILE:HG22 | 1.96                     | 0.47              |
| 5:5D:1849:ILE:HD13 | 5:5D:1923:ILE:HD12 | 1.96                     | 0.47              |
| 37:2A:150:U:H2'    | 37:2A:151:C:C6     | 2.50                     | 0.47              |
| 43:2G:1110:VAL:O   | 43:2G:1111:CYS:C   | 2.57                     | 0.47              |
| 44:2H:573:ASP:O    | 44:2H:577:LYS:N    | 2.44                     | 0.47              |
| 3:5B:1343:SER:O    | 3:5B:1491:LYS:NZ   | 2.48                     | 0.47              |
| 5:5D:467:LEU:HD12  | 5:5D:467:LEU:N     | 2.30                     | 0.47              |
| 5:5D:1424:ILE:C    | 5:5D:1425:ILE:HD12 | 2.40                     | 0.47              |
| 43:2G:660:ALA:O    | 43:2G:661:ARG:C    | 2.53                     | 0.47              |
| 45:2I:558:LEU:O    | 45:2I:561:GLY:CA   | 2.63                     | 0.47              |
| 3:5B:475:SER:HB3   | 28:4G:108:LEU:HD11 | 1.96                     | 0.47              |
| 5:5D:1845:LEU:O    | 5:5D:1849:ILE:HD12 | 2.15                     | 0.47              |
| 5:5D:1961:LYS:HD3  | 5:5D:1971:ILE:HD11 | 1.97                     | 0.47              |
| 5:5D:2041:LEU:O    | 5:5D:2087:LYS:HA   | 2.15                     | 0.47              |
| 24:4C:174:LEU:HD11 | 24:4C:178:ARG:HE   | 1.80                     | 0.47              |
| 45:2I:923:GLY:HA3  | 45:2I:947:GLU:O    | 2.14                     | 0.47              |
| 49:2M:42:SER:O     | 49:2M:45:GLY:N     | 2.48                     | 0.47              |
| 2:5A:74:U:H2'      | 2:5A:75:G:C8       | 2.50                     | 0.47              |
| 2:5A:117:A:C2      | 10:5d:26:GLY:O     | 2.68                     | 0.47              |
| 3:5B:461:HIS:O     | 3:5B:462:ARG:NH1   | 2.48                     | 0.47              |
| 3:5B:1014:ASN:ND2  | 3:5B:1026:ASN:O    | 2.42                     | 0.47              |
| 5:5D:716:ALA:HB1   | 5:5D:751:PHE:CE1   | 2.50                     | 0.47              |
| 5:5D:1027:ILE:HG21 | 5:5D:1059:ILE:HD11 | 1.95                     | 0.47              |
| 5:5D:1157:ASN:O    | 5:5D:1161:ILE:N    | 2.39                     | 0.47              |
| 23:4B:518:ARG:O    | 23:4B:518:ARG:HG2  | 2.14                     | 0.47              |
| 24:4C:316:VAL:O    | 24:4C:317:ALA:C    | 2.58                     | 0.47              |
| 33:4L:29:ILE:HG23  | 33:4L:72:CYS:SG    | 2.55                     | 0.47              |
| 37:2A:153:A:C8     | 37:2A:154:C:H5'    | 2.50                     | 0.47              |
| 37:2A:183:G:H2'    | 37:2A:184:C:C6     | 2.50                     | 0.47              |
| 43:2G:993:ILE:O    | 43:2G:994:LEU:C    | 2.56                     | 0.47              |
| 43:2G:1264:VAL:O   | 43:2G:1265:TYR:C   | 2.56                     | 0.47              |
| 4:5C:534:VAL:O     | 4:5C:535:ALA:C     | 2.58                     | 0.47              |
| 5:5D:1357:THR:O    | 5:5D:1361:GLU:HG3  | 2.15                     | 0.47              |
| 5:5D:2052:ILE:HG22 | 5:5D:2054:PRO:HD3  | 1.96                     | 0.47              |
| 2:5A:67:A:O2'      | 2:5A:68:C:C6       | 2.68                     | 0.47              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:5B:1959:THR:O    | 3:5B:1960:THR:C    | 2.57                     | 0.47              |
| 5:5D:1561:VAL:HB   | 5:5D:1645:VAL:HG22 | 1.97                     | 0.47              |
| 22:4A:109:G:H2'    | 22:4A:110:G:C8     | 2.50                     | 0.47              |
| 31:4J:284:GLU:CD   | 31:4J:284:GLU:O    | 2.58                     | 0.47              |
| 43:2G:567:VAL:O    | 43:2G:568:ARG:C    | 2.58                     | 0.47              |
| 43:2G:865:ARG:O    | 43:2G:866:LYS:C    | 2.56                     | 0.47              |
| 45:2I:44:ASP:O     | 45:2I:48:GLY:HA2   | 2.15                     | 0.47              |
| 46:2J:70:ALA:O     | 46:2J:74:MET:N     | 2.40                     | 0.47              |
| 3:5B:330:THR:O     | 3:5B:330:THR:OG1   | 2.31                     | 0.47              |
| 4:5C:360:ALA:N     | 4:5C:361:PRO:CD    | 2.79                     | 0.47              |
| 4:5C:711:ARG:HB3   | 4:5C:711:ARG:NH1   | 2.30                     | 0.47              |
| 4:5C:889:THR:O     | 32:4K:406:TRP:HA   | 2.15                     | 0.47              |
| 5:5D:1920:ILE:HD11 | 5:5D:1950:THR:CG2  | 2.45                     | 0.47              |
| 28:4G:800:MET:HE1  | 28:4G:813:LEU:HD22 | 1.96                     | 0.47              |
| 43:2G:471:ASP:O    | 43:2G:472:ILE:C    | 2.57                     | 0.47              |
| 43:2G:645:LEU:O    | 43:2G:646:PRO:C    | 2.56                     | 0.47              |
| 45:2I:1148:LEU:O   | 45:2I:1149:ARG:C   | 2.57                     | 0.47              |
| 3:5B:233:PRO:O     | 3:5B:237:THR:OG1   | 2.33                     | 0.46              |
| 4:5C:921:LEU:N     | 4:5C:922:GLU:OE1   | 2.47                     | 0.46              |
| 35:4N:118:THR:O    | 35:4N:122:VAL:HG23 | 2.15                     | 0.46              |
| 3:5B:214:ARG:HB3   | 3:5B:214:ARG:CZ    | 2.45                     | 0.46              |
| 25:4D:275:TYR:HA   | 25:4D:280:VAL:HG11 | 1.98                     | 0.46              |
| 33:4L:71:LEU:O     | 33:4L:71:LEU:HD23  | 2.16                     | 0.46              |
| 37:2A:141:C:H2'    | 37:2A:142:C:C6     | 2.50                     | 0.46              |
| 43:2G:952:ALA:O    | 43:2G:953:ASP:C    | 2.57                     | 0.46              |
| 5:5D:591:GLU:OE1   | 5:5D:992:TYR:CE2   | 2.68                     | 0.46              |
| 5:5D:1432:TRP:HE1  | 5:5D:1474:MET:HE2  | 1.80                     | 0.46              |
| 5:5D:1802:ILE:HD12 | 5:5D:1810:VAL:HG13 | 1.97                     | 0.46              |
| 28:4G:95:GLU:OE1   | 28:4G:95:GLU:N     | 2.49                     | 0.46              |
| 37:2A:107:A:C6     | 37:2A:108:G:C6     | 3.04                     | 0.46              |
| 43:2G:693:GLY:O    | 43:2G:695:VAL:N    | 2.48                     | 0.46              |
| 43:2G:810:ILE:O    | 43:2G:811:LEU:C    | 2.59                     | 0.46              |
| 43:2G:872:ILE:O    | 43:2G:873:GLU:C    | 2.57                     | 0.46              |
| 1:A:7:U:H4'        | 1:A:8:U:OP1        | 2.15                     | 0.46              |
| 2:5A:28:A:O2'      | 3:5B:643:GLY:HA3   | 2.16                     | 0.46              |
| 5:5D:1455:GLU:N    | 5:5D:1490:LEU:O    | 2.47                     | 0.46              |
| 5:5D:1672:LYS:HD2  | 5:5D:1672:LYS:N    | 2.30                     | 0.46              |
| 33:4L:166:GLN:O    | 33:4L:167:LYS:CD   | 2.62                     | 0.46              |
| 2:5A:99:C:H2'      | 2:5A:100:C:H6      | 1.79                     | 0.46              |
| 5:5D:935:LEU:H     | 5:5D:935:LEU:HD12  | 1.81                     | 0.46              |
| 33:4L:108:ARG:NH1  | 33:4L:163:PRO:O    | 2.39                     | 0.46              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 43:2G:745:ALA:O    | 43:2G:746:PHE:C    | 2.59                     | 0.46              |
| 43:2G:867:MET:O    | 43:2G:868:VAL:C    | 2.57                     | 0.46              |
| 43:2G:1165:TYR:O   | 43:2G:1166:ILE:C   | 2.59                     | 0.46              |
| 5:5D:639:ILE:HD11  | 5:5D:646:VAL:CG2   | 2.46                     | 0.46              |
| 4:5C:560:VAL:O     | 4:5C:561:LYS:C     | 2.59                     | 0.46              |
| 5:5D:617:ILE:HD12  | 5:5D:628:LEU:HD13  | 1.98                     | 0.46              |
| 5:5D:1183:LYS:O    | 5:5D:1184:LEU:HD12 | 2.15                     | 0.46              |
| 5:5D:1914:GLU:O    | 5:5D:1917:SER:OG   | 2.30                     | 0.46              |
| 16:6b:19:ASP:C     | 16:6b:21:ILE:H     | 2.23                     | 0.46              |
| 23:4B:580:ASN:N    | 23:4B:580:ASN:OD1  | 2.49                     | 0.46              |
| 24:4C:101:VAL:HG21 | 24:4C:134:ARG:HB2  | 1.97                     | 0.46              |
| 37:2A:3:C:H2'      | 37:2A:4:G:C8       | 2.51                     | 0.46              |
| 43:2G:429:ARG:O    | 43:2G:432:THR:N    | 2.46                     | 0.46              |
| 43:2G:1119:VAL:O   | 43:2G:1122:THR:N   | 2.49                     | 0.46              |
| 43:2G:1129:LEU:O   | 43:2G:1130:PRO:C   | 2.59                     | 0.46              |
| 43:2G:1256:HIS:O   | 43:2G:1257:PRO:C   | 2.58                     | 0.46              |
| 3:5B:1618:LYS:NZ   | 3:5B:1663:ASP:OD1  | 2.46                     | 0.46              |
| 3:5B:2069:SER:O    | 3:5B:2072:GLU:HG3  | 2.16                     | 0.46              |
| 5:5D:475:PHE:CE1   | 5:5D:514:LEU:HD23  | 2.51                     | 0.46              |
| 5:5D:531:ILE:HD12  | 5:5D:531:ILE:N     | 2.31                     | 0.46              |
| 5:5D:757:ALA:O     | 5:5D:761:VAL:HG23  | 2.16                     | 0.46              |
| 5:5D:1825:ASN:N    | 5:5D:1854:GLU:OE2  | 2.37                     | 0.46              |
| 37:2A:149:A:H2'    | 37:2A:150:U:C6     | 2.50                     | 0.46              |
| 43:2G:257:THR:O    | 43:2G:259:SER:N    | 2.49                     | 0.46              |
| 1:A:28:G:C2        | 37:2A:35:A:C2      | 3.04                     | 0.46              |
| 4:5C:215:VAL:HG11  | 4:5C:242:LEU:HD21  | 1.98                     | 0.46              |
| 4:5C:405:LYS:O     | 4:5C:405:LYS:HD3   | 2.15                     | 0.46              |
| 5:5D:2003:GLN:O    | 5:5D:2007:VAL:HG23 | 2.16                     | 0.46              |
| 15:6a:73:PRO:O     | 15:6a:75:ASP:N     | 2.49                     | 0.46              |
| 42:2F:403:ASN:N    | 42:2F:417:ARG:O    | 2.49                     | 0.46              |
| 43:2G:210:ALA:O    | 43:2G:213:LYS:N    | 2.48                     | 0.46              |
| 3:5B:941:LYS:HG2   | 3:5B:951:LEU:HD13  | 1.97                     | 0.46              |
| 5:5D:1868:LEU:HD11 | 5:5D:1890:LYS:HE3  | 1.97                     | 0.46              |
| 2:5A:96:A:H61      | 12:5f:23:GLY:N     | 2.07                     | 0.45              |
| 3:5B:2174:PRO:O    | 3:5B:2210:LYS:NZ   | 2.44                     | 0.45              |
| 4:5C:674:CYS:SG    | 4:5C:675:PHE:N     | 2.87                     | 0.45              |
| 4:5C:926:ALA:HA    | 4:5C:929:LEU:HD23  | 1.96                     | 0.45              |
| 5:5D:1742:THR:O    | 5:5D:1742:THR:HG22 | 2.16                     | 0.45              |
| 5:5D:1920:ILE:HD11 | 5:5D:1950:THR:HG23 | 1.99                     | 0.45              |
| 28:4G:15:LEU:HD22  | 28:4G:15:LEU:H     | 1.80                     | 0.45              |
| 28:4G:711:LEU:H    | 28:4G:711:LEU:HD22 | 1.79                     | 0.45              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 43:2G:841:ALA:C    | 43:2G:843:LYS:N    | 2.73                     | 0.45              |
| 49:2M:62:ALA:O     | 49:2M:65:ARG:N     | 2.50                     | 0.45              |
| 2:5A:17:U:H2'      | 2:5A:18:C:C6       | 2.50                     | 0.45              |
| 3:5B:1517:LYS:O    | 3:5B:1517:LYS:HG2  | 2.16                     | 0.45              |
| 3:5B:1957:ASP:O    | 3:5B:1960:THR:OG1  | 2.30                     | 0.45              |
| 5:5D:1672:LYS:NZ   | 5:5D:1860:ILE:HG21 | 2.32                     | 0.45              |
| 5:5D:1753:ASP:O    | 5:5D:1756:THR:HG22 | 2.16                     | 0.45              |
| 22:4A:0:M7M:HBZB   | 22:4A:1:A:N6       | 2.32                     | 0.45              |
| 32:4K:401:SER:OG   | 32:4K:403:ASP:OD1  | 2.16                     | 0.45              |
| 37:2A:152:G:O2'    | 37:2A:153:A:H1'    | 2.16                     | 0.45              |
| 42:2F:394:TYR:C    | 42:2F:396:LEU:H    | 2.24                     | 0.45              |
| 1:A:34:G:N3        | 1:A:35:U:H5''      | 2.31                     | 0.45              |
| 4:5C:832:TYR:HD1   | 4:5C:901:PHE:HA    | 1.82                     | 0.45              |
| 5:5D:1768:PRO:HG3  | 5:5D:1776:ILE:HG22 | 1.98                     | 0.45              |
| 23:4B:462:GLU:OE1  | 23:4B:465:ARG:NH1  | 2.50                     | 0.45              |
| 43:2G:914:PHE:O    | 43:2G:915:GLY:C    | 2.58                     | 0.45              |
| 49:2M:46:HIS:O     | 49:2M:47:PHE:C     | 2.59                     | 0.45              |
| 1:A:38:C:C4'       | 1:A:39:U:OP1       | 2.35                     | 0.45              |
| 4:5C:283:ASP:OD1   | 4:5C:283:ASP:C     | 2.59                     | 0.45              |
| 5:5D:2084:LEU:HD12 | 5:5D:2086:GLN:O    | 2.17                     | 0.45              |
| 42:2F:276:GLY:C    | 42:2F:278:LEU:N    | 2.60                     | 0.45              |
| 4:5C:723:ASP:C     | 4:5C:723:ASP:OD1   | 2.59                     | 0.45              |
| 5:5D:567:ALA:HB1   | 5:5D:575:LEU:HD21  | 1.98                     | 0.45              |
| 23:4B:646:MET:HE2  | 23:4B:646:MET:CA   | 2.47                     | 0.45              |
| 25:4D:112:LYS:O    | 25:4D:116:ASP:OD1  | 2.34                     | 0.45              |
| 37:2A:180:G:H2'    | 37:2A:181:G:H8     | 1.81                     | 0.45              |
| 43:2G:1031:VAL:O   | 43:2G:1032:GLN:C   | 2.60                     | 0.45              |
| 43:2G:687:VAL:O    | 43:2G:690:ILE:N    | 2.50                     | 0.45              |
| 43:2G:889:GLU:O    | 43:2G:890:GLU:C    | 2.57                     | 0.45              |
| 45:2I:672:GLY:O    | 45:2I:691:THR:N    | 2.49                     | 0.45              |
| 1:A:31:C:C4        | 1:A:32:C:N4        | 2.73                     | 0.45              |
| 1:A:32:C:N3        | 37:2A:31:G:O6      | 2.50                     | 0.45              |
| 2:5A:92:U:N3       | 8:5b:36:MET:N      | 2.64                     | 0.45              |
| 3:5B:206:TRP:CD1   | 3:5B:213:LEU:HD21  | 2.52                     | 0.45              |
| 4:5C:716:GLU:O     | 4:5C:720:THR:HG23  | 2.16                     | 0.45              |
| 5:5D:801:PHE:HB3   | 5:5D:821:LEU:HD21  | 1.98                     | 0.45              |
| 5:5D:1167:MET:HA   | 5:5D:1167:MET:HE3  | 1.98                     | 0.45              |
| 5:5D:1290:ILE:HG23 | 5:5D:1290:ILE:O    | 2.17                     | 0.45              |
| 5:5D:1425:ILE:N    | 5:5D:1425:ILE:CD1  | 2.79                     | 0.45              |
| 5:5D:1868:LEU:HD13 | 5:5D:1890:LYS:HG2  | 1.98                     | 0.45              |
| 28:4G:892:GLU:C    | 28:4G:892:GLU:OE1  | 2.59                     | 0.45              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 31:4J:332:SER:O    | 31:4J:332:SER:OG   | 2.29                     | 0.45              |
| 43:2G:830:TYR:O    | 43:2G:831:ARG:C    | 2.57                     | 0.45              |
| 45:2I:1141:PHE:O   | 45:2I:1144:VAL:N   | 2.49                     | 0.45              |
| 48:2L:46:CYS:O     | 48:2L:50:ASN:N     | 2.43                     | 0.45              |
| 3:5B:658:ARG:NH2   | 28:4G:102:ASP:OD2  | 2.47                     | 0.45              |
| 4:5C:156:GLU:OE1   | 4:5C:156:GLU:N     | 2.47                     | 0.45              |
| 5:5D:1300:GLU:OE1  | 5:5D:1300:GLU:N    | 2.36                     | 0.45              |
| 5:5D:2036:VAL:HG23 | 5:5D:2093:ASP:OD1  | 2.17                     | 0.45              |
| 22:4A:115:G:H2'    | 22:4A:116:G:C8     | 2.52                     | 0.45              |
| 37:2A:114:A:H2'    | 37:2A:115:G:H8     | 1.81                     | 0.45              |
| 43:2G:1078:VAL:O   | 43:2G:1081:PHE:N   | 2.50                     | 0.45              |
| 3:5B:857:ASN:ND2   | 3:5B:860:GLN:OE1   | 2.50                     | 0.45              |
| 4:5C:676:ALA:HB3   | 4:5C:815:VAL:HB    | 1.98                     | 0.45              |
| 23:4B:416:ASN:CG   | 23:4B:416:ASN:O    | 2.60                     | 0.45              |
| 42:2F:394:TYR:C    | 42:2F:396:LEU:N    | 2.75                     | 0.45              |
| 43:2G:708:ALA:O    | 43:2G:711:ALA:N    | 2.49                     | 0.45              |
| 45:2I:663:LEU:O    | 45:2I:678:VAL:CA   | 2.65                     | 0.45              |
| 3:5B:198:GLU:OE1   | 3:5B:198:GLU:N     | 2.43                     | 0.45              |
| 3:5B:1189:MET:O    | 3:5B:1191:GLY:N    | 2.50                     | 0.45              |
| 3:5B:1194:CYS:HA   | 3:5B:1229:PHE:O    | 2.17                     | 0.45              |
| 3:5B:1638:ASN:ND2  | 3:5B:1656:THR:HG22 | 2.32                     | 0.45              |
| 5:5D:1464:GLY:N    | 5:5D:1465:PRO:CD   | 2.80                     | 0.45              |
| 22:4A:118:A:OP2    | 22:4A:118:A:C8     | 2.70                     | 0.45              |
| 24:4C:109:LYS:O    | 24:4C:119:ILE:HD11 | 2.16                     | 0.45              |
| 28:4G:921:ASN:ND2  | 28:4G:921:ASN:O    | 2.37                     | 0.45              |
| 33:4L:57:VAL:O     | 33:4L:132:SER:HA   | 2.17                     | 0.45              |
| 33:4L:146:GLU:OE2  | 33:4L:146:GLU:N    | 2.49                     | 0.45              |
| 37:2A:59:A:H2'     | 37:2A:60:U:O4'     | 2.17                     | 0.45              |
| 43:2G:629:ALA:O    | 43:2G:630:ARG:C    | 2.56                     | 0.45              |
| 43:2G:791:VAL:O    | 43:2G:792:VAL:C    | 2.60                     | 0.45              |
| 45:2I:215:LEU:O    | 45:2I:218:ASN:N    | 2.50                     | 0.45              |
| 45:2I:1141:PHE:O   | 45:2I:1142:GLN:C   | 2.60                     | 0.45              |
| 45:2I:1191:LYS:O   | 45:2I:1192:ASN:C   | 2.59                     | 0.45              |
| 4:5C:726:LEU:HD23  | 4:5C:726:LEU:O     | 2.18                     | 0.44              |
| 5:5D:1037:LEU:CG   | 5:5D:1052:ILE:HD11 | 2.47                     | 0.44              |
| 28:4G:122:GLN:O    | 28:4G:126:GLU:HG3  | 2.16                     | 0.44              |
| 43:2G:1013:ILE:O   | 43:2G:1014:LYS:C   | 2.60                     | 0.44              |
| 43:2G:1128:VAL:O   | 43:2G:1129:LEU:C   | 2.60                     | 0.44              |
| 45:2I:672:GLY:C    | 45:2I:691:THR:H    | 2.25                     | 0.44              |
| 1:A:33:U:O3'       | 1:A:34:G:O4'       | 2.35                     | 0.44              |
| 1:A:118:A:P        | 35:4N:101:GLY:HA2  | 2.57                     | 0.44              |

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| Atom-1            | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|--------------------|--------------------------|-------------------|
| 3:5B:2019:PRO:O   | 3:5B:2024:GLN:NE2  | 2.50                     | 0.44              |
| 14:6A:35:A:O2'    | 14:6A:36:A:O5'     | 2.28                     | 0.44              |
| 14:6A:91:A:H2'    | 14:6A:92:A:H8      | 1.82                     | 0.44              |
| 22:4A:91:A:H2'    | 22:4A:92:C:C6      | 2.53                     | 0.44              |
| 31:4J:284:GLU:O   | 31:4J:284:GLU:CG   | 2.65                     | 0.44              |
| 37:2A:54:U:H5'    | 42:2F:424:ARG:CA   | 2.47                     | 0.44              |
| 43:2G:658:TRP:O   | 43:2G:659:GLN:C    | 2.60                     | 0.44              |
| 43:2G:669:GLN:O   | 43:2G:670:GLN:C    | 2.60                     | 0.44              |
| 43:2G:749:ALA:O   | 43:2G:750:ILE:C    | 2.60                     | 0.44              |
| 43:2G:937:LEU:O   | 43:2G:938:TRP:C    | 2.59                     | 0.44              |
| 2:5A:81:U:O5'     | 2:5A:81:U:C6       | 2.70                     | 0.44              |
| 4:5C:276:TYR:O    | 4:5C:279:ARG:NH2   | 2.50                     | 0.44              |
| 5:5D:597:THR:HG21 | 5:5D:634:ARG:CD    | 2.48                     | 0.44              |
| 7:4a:80:MET:O     | 8:4b:59:SER:N      | 2.44                     | 0.44              |
| 37:2A:143:A:OP2   | 37:2A:143:A:C2     | 2.71                     | 0.44              |
| 43:2G:935:THR:O   | 43:2G:936:VAL:C    | 2.58                     | 0.44              |
| 43:2G:1246:MET:O  | 43:2G:1247:LEU:C   | 2.59                     | 0.44              |
| 2:5A:117:A:C6     | 10:5d:26:GLY:HA3   | 2.52                     | 0.44              |
| 3:5B:835:ASP:OD1  | 3:5B:835:ASP:N     | 2.49                     | 0.44              |
| 5:5D:569:LEU:HD13 | 5:5D:575:LEU:HB2   | 1.98                     | 0.44              |
| 5:5D:1015:PHE:CE2 | 5:5D:1063:LEU:HD23 | 2.53                     | 0.44              |
| 5:5D:1499:ASP:OD2 | 5:5D:1763:ARG:NH1  | 2.42                     | 0.44              |
| 14:6A:90:G:H2'    | 14:6A:91:A:H8      | 1.82                     | 0.44              |
| 14:6A:91:A:H2'    | 14:6A:92:A:C8      | 2.53                     | 0.44              |
| 22:4A:18:G:C2     | 25:4D:358:ARG:HD2  | 2.53                     | 0.44              |
| 22:4A:122:U:H1'   | 12:4f:65:ASN:CA    | 2.47                     | 0.44              |
| 24:4C:180:TRP:O   | 24:4C:183:ASN:OD1  | 2.36                     | 0.44              |
| 24:4C:275:ASN:O   | 24:4C:301:ALA:N    | 2.50                     | 0.44              |
| 29:4H:45:GLN:O    | 29:4H:49:GLY:N     | 2.51                     | 0.44              |
| 30:4I:8:GLN:HB2   | 30:4I:9:PRO:CD     | 2.47                     | 0.44              |
| 12:4f:22:ASN:N    | 12:4f:66:SER:O     | 2.49                     | 0.44              |
| 2:5A:92:U:C4      | 8:5b:36:MET:N      | 2.85                     | 0.44              |
| 3:5B:441:VAL:O    | 3:5B:445:VAL:HG23  | 2.18                     | 0.44              |
| 3:5B:529:THR:OG1  | 34:4M:45:LYS:NZ    | 2.43                     | 0.44              |
| 3:5B:534:GLU:HA   | 3:5B:537:LYS:HE2   | 1.99                     | 0.44              |
| 3:5B:1839:TRP:CH2 | 28:4G:301:VAL:HG22 | 2.52                     | 0.44              |
| 3:5B:2298:LEU:CD2 | 5:5D:1265:GLN:OE1  | 2.66                     | 0.44              |
| 22:4A:127:C:H1'   | 9:4c:47:ARG:C      | 2.42                     | 0.44              |
| 24:4C:458:GLU:CG  | 24:4C:459:PRO:HD2  | 2.47                     | 0.44              |
| 33:4L:87:ILE:HD12 | 33:4L:87:ILE:H     | 1.81                     | 0.44              |
| 34:4M:8:ASP:OD1   | 34:4M:8:ASP:O      | 2.35                     | 0.44              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 43:2G:834:VAL:O    | 43:2G:835:ASP:C    | 2.60                     | 0.44              |
| 43:2G:874:LYS:O    | 43:2G:875:ILE:C    | 2.60                     | 0.44              |
| 3:5B:1524:SER:O    | 3:5B:1528:GLN:HG2  | 2.17                     | 0.44              |
| 4:5C:829:GLU:OE2   | 4:5C:878:ILE:HG22  | 2.18                     | 0.44              |
| 5:5D:783:ALA:HB3   | 5:5D:806:ILE:HG21  | 2.00                     | 0.44              |
| 5:5D:1845:LEU:HA   | 5:5D:1848:ILE:HG22 | 2.00                     | 0.44              |
| 5:5D:1846:ILE:HG22 | 5:5D:1892:ASN:OD1  | 2.18                     | 0.44              |
| 5:5D:1919:ALA:O    | 5:5D:1923:ILE:HG12 | 2.18                     | 0.44              |
| 5:5D:2041:LEU:HD23 | 5:5D:2108:PHE:CZ   | 2.52                     | 0.44              |
| 31:4J:264:ASP:OD1  | 31:4J:264:ASP:C    | 2.60                     | 0.44              |
| 37:2A:112:G:H2'    | 37:2A:113:G:C8     | 2.50                     | 0.44              |
| 43:2G:429:ARG:C    | 43:2G:432:THR:H    | 2.26                     | 0.44              |
| 43:2G:631:ALA:O    | 43:2G:632:PHE:C    | 2.58                     | 0.44              |
| 43:2G:831:ARG:O    | 43:2G:832:GLN:C    | 2.58                     | 0.44              |
| 3:5B:1946:ASN:O    | 3:5B:1947:ASN:HB3  | 2.18                     | 0.44              |
| 3:5B:1953:ILE:HD12 | 3:5B:1986:LEU:HD12 | 2.00                     | 0.44              |
| 3:5B:1980:GLU:OE2  | 23:4B:494:THR:OG1  | 2.35                     | 0.44              |
| 4:5C:457:VAL:HA    | 4:5C:462:GLY:HA3   | 2.00                     | 0.44              |
| 5:5D:1784:HIS:O    | 5:5D:1788:LEU:HG   | 2.18                     | 0.44              |
| 22:4A:127:C:O5'    | 22:4A:127:C:C6     | 2.70                     | 0.44              |
| 23:4B:576:HIS:HB3  | 23:4B:579:VAL:HG23 | 1.99                     | 0.44              |
| 29:4H:152:ARG:CB   | 30:4I:75:ALA:HB2   | 2.48                     | 0.44              |
| 9:4c:109:VAL:N     | 10:4d:63:LEU:O     | 2.42                     | 0.44              |
| 37:2A:40:C:C5'     | 37:2A:40:C:C6      | 2.92                     | 0.44              |
| 37:2A:113:G:H2'    | 37:2A:114:A:H8     | 1.82                     | 0.44              |
| 37:2A:153:A:H2'    | 37:2A:154:C:H5''   | 1.99                     | 0.44              |
| 43:2G:1223:SER:O   | 43:2G:1224:PRO:C   | 2.60                     | 0.44              |
| 2:5A:71:C:H2'      | 2:5A:72:U:O4'      | 2.17                     | 0.44              |
| 3:5B:246:LEU:HD11  | 3:5B:411:PHE:HE2   | 1.81                     | 0.44              |
| 3:5B:1314:VAL:O    | 3:5B:1318:THR:OG1  | 2.24                     | 0.44              |
| 4:5C:670:SER:HA    | 4:5C:823:ALA:HA    | 1.99                     | 0.44              |
| 24:4C:220:SER:O    | 24:4C:220:SER:OG   | 2.25                     | 0.44              |
| 25:4D:212:MET:HE1  | 25:4D:232:MET:SD   | 2.58                     | 0.44              |
| 25:4D:346:PRO:O    | 27:4F:121:ARG:NH2  | 2.51                     | 0.44              |
| 27:4F:117:GLU:OE1  | 27:4F:121:ARG:NH1  | 2.50                     | 0.44              |
| 31:4J:270:GLU:N    | 31:4J:270:GLU:OE1  | 2.51                     | 0.44              |
| 37:2A:182:U:H2'    | 37:2A:183:G:H8     | 1.81                     | 0.44              |
| 43:2G:578:ILE:O    | 43:2G:579:GLU:C    | 2.57                     | 0.44              |
| 43:2G:606:LEU:O    | 43:2G:609:MET:N    | 2.51                     | 0.44              |
| 45:2I:406:PRO:CA   | 45:2I:1122:LEU:O   | 2.65                     | 0.44              |
| 3:5B:543:ALA:HB3   | 3:5B:651:TRP:CE2   | 2.52                     | 0.44              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:5B:564:TYR:CG    | 3:5B:574:LEU:HD22  | 2.53                     | 0.44              |
| 5:5D:616:GLU:HA    | 5:5D:616:GLU:OE1   | 2.18                     | 0.44              |
| 5:5D:1604:LEU:HD13 | 5:5D:1609:LEU:CD2  | 2.47                     | 0.44              |
| 5:5D:2039:VAL:HB   | 5:5D:2090:VAL:HG13 | 2.00                     | 0.44              |
| 35:4N:58:LEU:HD22  | 35:4N:58:LEU:H     | 1.83                     | 0.44              |
| 43:2G:1029:GLU:O   | 43:2G:1032:GLN:N   | 2.51                     | 0.44              |
| 45:2I:676:ARG:O    | 45:2I:686:LEU:CA   | 2.65                     | 0.44              |
| 1:A:34:G:C5        | 1:A:35:U:C4        | 3.05                     | 0.43              |
| 1:A:35:U:O2'       | 1:A:36:C:C5        | 2.71                     | 0.43              |
| 1:A:117:G:OP1      | 35:4N:103:LYS:HB3  | 2.17                     | 0.43              |
| 4:5C:260:ILE:HG22  | 4:5C:311:SER:OG    | 2.18                     | 0.43              |
| 4:5C:573:GLU:N     | 4:5C:573:GLU:OE1   | 2.51                     | 0.43              |
| 5:5D:765:GLU:N     | 5:5D:765:GLU:OE1   | 2.51                     | 0.43              |
| 43:2G:1230:VAL:O   | 43:2G:1233:ALA:N   | 2.51                     | 0.43              |
| 1:A:116:G:N2       | 14:6A:38:G:H1      | 2.15                     | 0.43              |
| 1:A:116:G:H4'      | 35:4N:98:HIS:CE1   | 2.53                     | 0.43              |
| 3:5B:2162:GLN:O    | 3:5B:2294:TYR:OH   | 2.18                     | 0.43              |
| 3:5B:2317:PHE:CE2  | 5:5D:1070:LEU:HD11 | 2.52                     | 0.43              |
| 5:5D:526:ASN:ND2   | 5:5D:531:ILE:O     | 2.51                     | 0.43              |
| 5:5D:815:LEU:HD21  | 5:5D:821:LEU:HB3   | 2.00                     | 0.43              |
| 25:4D:99:LEU:O     | 25:4D:99:LEU:HD23  | 2.18                     | 0.43              |
| 45:2I:1148:LEU:O   | 45:2I:1151:GLU:N   | 2.51                     | 0.43              |
| 4:5C:224:GLY:HA3   | 4:5C:438:ILE:HD12  | 2.00                     | 0.43              |
| 4:5C:813:ARG:O     | 4:5C:816:VAL:HG12  | 2.18                     | 0.43              |
| 5:5D:1360:ALA:HB2  | 5:5D:1490:LEU:HD11 | 2.00                     | 0.43              |
| 14:6A:92:A:H2'     | 14:6A:93:G:H8      | 1.83                     | 0.43              |
| 34:4M:69:GLU:OE2   | 34:4M:69:GLU:N     | 2.51                     | 0.43              |
| 37:2A:98:G:H5'     | 37:2A:104:U:OP2    | 2.19                     | 0.43              |
| 37:2A:154:C:O2'    | 37:2A:155:C:C5'    | 2.66                     | 0.43              |
| 37:2A:181:G:H2'    | 37:2A:182:U:C6     | 2.50                     | 0.43              |
| 43:2G:792:VAL:O    | 43:2G:793:LYS:C    | 2.59                     | 0.43              |
| 4:5C:668:GLU:OE2   | 4:5C:669:THR:HG22  | 2.19                     | 0.43              |
| 5:5D:1628:GLU:CD   | 5:5D:1628:GLU:N    | 2.76                     | 0.43              |
| 5:5D:1844:GLY:O    | 5:5D:1848:ILE:HG22 | 2.18                     | 0.43              |
| 28:4G:800:MET:HE2  | 28:4G:804:LEU:HG   | 2.00                     | 0.43              |
| 1:A:17:G:H2'       | 1:A:18:C:C6        | 2.53                     | 0.43              |
| 1:A:117:G:H1       | 14:6A:37:C:N4      | 2.15                     | 0.43              |
| 2:5A:92:U:O4       | 8:5b:34:VAL:O      | 2.37                     | 0.43              |
| 3:5B:65:HIS:O      | 3:5B:69:ILE:HG13   | 2.17                     | 0.43              |
| 3:5B:1357:MET:SD   | 3:5B:1357:MET:C    | 3.02                     | 0.43              |
| 3:5B:2275:ALA:HB3  | 3:5B:2295:GLU:OE1  | 2.19                     | 0.43              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 4:5C:484:THR:OG1   | 4:5C:485:ASP:N     | 2.51                     | 0.43              |
| 14:6A:51:U:O2'     | 14:6A:52:U:H5'     | 2.18                     | 0.43              |
| 24:4C:184:TYR:CD1  | 24:4C:184:TYR:C    | 2.97                     | 0.43              |
| 35:4N:115:GLU:N    | 35:4N:115:GLU:CD   | 2.77                     | 0.43              |
| 35:4N:122:VAL:HG12 | 35:4N:126:PHE:CZ   | 2.52                     | 0.43              |
| 49:2M:64:VAL:O     | 49:2M:65:ARG:C     | 2.59                     | 0.43              |
| 1:A:20:U:C2        | 37:2A:42:G:C2      | 3.04                     | 0.43              |
| 3:5B:1090:ARG:HG2  | 3:5B:1091:TYR:O    | 2.19                     | 0.43              |
| 4:5C:618:THR:HB    | 4:5C:630:LEU:HB2   | 2.01                     | 0.43              |
| 5:5D:1518:VAL:O    | 5:5D:1518:VAL:CG1  | 2.67                     | 0.43              |
| 36:4Z:488:ILE:H    | 36:4Z:503:SER:HA   | 1.83                     | 0.43              |
| 37:2A:40:C:H5''    | 37:2A:40:C:C6      | 2.32                     | 0.43              |
| 37:2A:148:C:H2'    | 37:2A:149:A:H8     | 1.82                     | 0.43              |
| 43:2G:82:PRO:O     | 43:2G:86:ALA:N     | 2.42                     | 0.43              |
| 43:2G:310:TRP:O    | 43:2G:311:ALA:C    | 2.62                     | 0.43              |
| 43:2G:625:ARG:O    | 43:2G:626:ASN:C    | 2.61                     | 0.43              |
| 43:2G:1262:ARG:O   | 43:2G:1263:ASP:C   | 2.61                     | 0.43              |
| 2:5A:89:U:C2'      | 2:5A:90:U:H5''     | 2.47                     | 0.43              |
| 3:5B:147:MET:HG3   | 3:5B:151:MET:HE3   | 2.01                     | 0.43              |
| 5:5D:530:THR:CB    | 5:5D:531:ILE:HD12  | 2.48                     | 0.43              |
| 5:5D:595:ILE:HD12  | 5:5D:992:TYR:HB2   | 2.01                     | 0.43              |
| 24:4C:99:ILE:HG22  | 24:4C:101:VAL:HG23 | 2.01                     | 0.43              |
| 37:2A:142:C:H2'    | 37:2A:143:A:H5'    | 1.97                     | 0.43              |
| 43:2G:665:ILE:O    | 43:2G:668:VAL:N    | 2.52                     | 0.43              |
| 45:2I:318:ASP:N    | 45:2I:321:MET:O    | 2.27                     | 0.43              |
| 3:5B:97:HIS:ND1    | 3:5B:649:GLU:OE1   | 2.51                     | 0.43              |
| 3:5B:1807:ILE:HB   | 3:5B:1820:LYS:HB3  | 2.00                     | 0.43              |
| 4:5C:405:LYS:HA    | 4:5C:405:LYS:HE2   | 1.99                     | 0.43              |
| 4:5C:705:VAL:O     | 4:5C:706:GLN:C     | 2.62                     | 0.43              |
| 5:5D:1518:VAL:O    | 5:5D:1518:VAL:HG12 | 2.17                     | 0.43              |
| 5:5D:1960:LEU:CD1  | 5:5D:1982:VAL:HG22 | 2.48                     | 0.43              |
| 14:6A:89:U:H2'     | 14:6A:90:G:C8      | 2.53                     | 0.43              |
| 24:4C:92:ARG:HA    | 24:4C:92:ARG:NE    | 2.34                     | 0.43              |
| 27:4F:29:ARG:HD3   | 27:4F:79:CYS:SG    | 2.58                     | 0.43              |
| 28:4G:668:ALA:O    | 28:4G:672:ALA:N    | 2.46                     | 0.43              |
| 43:2G:782:GLU:O    | 43:2G:783:GLU:C    | 2.62                     | 0.43              |
| 43:2G:889:GLU:O    | 43:2G:892:LEU:N    | 2.51                     | 0.43              |
| 43:2G:916:THR:O    | 43:2G:917:VAL:C    | 2.61                     | 0.43              |
| 43:2G:981:TYR:C    | 43:2G:983:GLY:N    | 2.75                     | 0.43              |
| 45:2I:147:ASP:N    | 45:2I:151:ARG:O    | 2.42                     | 0.43              |
| 3:5B:683:LEU:HD21  | 27:4F:43:GLU:HG2   | 2.01                     | 0.43              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 16:6b:19:ASP:C     | 16:6b:21:ILE:N     | 2.77                     | 0.43              |
| 23:4B:672:LEU:HD22 | 24:4C:446:PRO:HG2  | 2.01                     | 0.43              |
| 25:4D:61:ALA:HB2   | 25:4D:106:GLU:OE1  | 2.19                     | 0.43              |
| 45:2I:430:GLY:O    | 45:2I:431:PRO:C    | 2.61                     | 0.43              |
| 45:2I:886:GLU:CA   | 45:2I:910:ALA:O    | 2.67                     | 0.43              |
| 1:A:116:G:HO2'     | 35:4N:98:HIS:HD1   | 1.66                     | 0.43              |
| 5:5D:534:ASP:OD1   | 5:5D:534:ASP:C     | 2.62                     | 0.43              |
| 5:5D:831:THR:CG2   | 5:5D:869:LEU:HD11  | 2.48                     | 0.43              |
| 14:6A:89:U:H2'     | 14:6A:90:G:H8      | 1.84                     | 0.43              |
| 22:4A:120:U:C6     | 22:4A:120:U:C3'    | 3.01                     | 0.43              |
| 24:4C:499:ASP:OD1  | 24:4C:500:ILE:N    | 2.52                     | 0.43              |
| 25:4D:270:HIS:O    | 25:4D:271:THR:HG23 | 2.18                     | 0.43              |
| 43:2G:627:THR:O    | 43:2G:630:ARG:N    | 2.52                     | 0.43              |
| 45:2I:5:ASN:O      | 45:2I:1176:GLY:HA3 | 2.19                     | 0.43              |
| 1:A:117:G:H1       | 14:6A:37:C:H42     | 1.66                     | 0.42              |
| 3:5B:113:ILE:CD1   | 3:5B:187:PRO:HG3   | 2.49                     | 0.42              |
| 5:5D:1196:SER:O    | 5:5D:1196:SER:OG   | 2.34                     | 0.42              |
| 5:5D:1923:ILE:HG21 | 5:5D:1946:ALA:HB2  | 2.01                     | 0.42              |
| 14:6A:45:A:C6      | 14:6A:47:A:N6      | 2.87                     | 0.42              |
| 24:4C:282:HIS:N    | 24:4C:295:ASN:O    | 2.46                     | 0.42              |
| 37:2A:178:A:N3     | 37:2A:178:A:H2'    | 2.34                     | 0.42              |
| 43:2G:854:VAL:O    | 43:2G:856:ASP:N    | 2.52                     | 0.42              |
| 43:2G:928:TYR:O    | 43:2G:929:LEU:C    | 2.61                     | 0.42              |
| 43:2G:1016:LEU:O   | 43:2G:1017:LEU:C   | 2.62                     | 0.42              |
| 43:2G:1090:PRO:O   | 43:2G:1091:HIS:C   | 2.62                     | 0.42              |
| 1:A:37:C:C2'       | 1:A:38:C:O5'       | 2.67                     | 0.42              |
| 3:5B:579:GLN:HG3   | 3:5B:629:PHE:H     | 1.84                     | 0.42              |
| 3:5B:2038:GLN:CB   | 5:5D:1035:LEU:CG   | 2.95                     | 0.42              |
| 4:5C:446:LYS:HB3   | 4:5C:447:PRO:HD3   | 2.01                     | 0.42              |
| 5:5D:464:VAL:HA    | 5:5D:467:LEU:HD13  | 2.02                     | 0.42              |
| 5:5D:848:ASP:O     | 5:5D:852:MET:HG3   | 2.20                     | 0.42              |
| 5:5D:1569:THR:CG2  | 5:5D:1570:ARG:N    | 2.82                     | 0.42              |
| 14:6A:92:A:H2'     | 14:6A:93:G:C8      | 2.54                     | 0.42              |
| 22:4A:90:G:H2'     | 22:4A:91:A:C8      | 2.55                     | 0.42              |
| 27:4F:30:PHE:HB3   | 27:4F:63:ILE:HD11  | 2.01                     | 0.42              |
| 37:2A:64:A:H2'     | 37:2A:65:U:C6      | 2.54                     | 0.42              |
| 43:2G:682:HIS:O    | 43:2G:683:LEU:C    | 2.61                     | 0.42              |
| 43:2G:723:SER:C    | 43:2G:725:ASP:H    | 2.26                     | 0.42              |
| 43:2G:948:ARG:O    | 43:2G:949:GLN:C    | 2.60                     | 0.42              |
| 45:2I:1189:LYS:O   | 45:2I:1190:GLN:C   | 2.62                     | 0.42              |
| 3:5B:1189:MET:O    | 3:5B:1190:CYS:C    | 2.62                     | 0.42              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 4:5C:478:THR:HA    | 4:5C:494:GLY:HA3   | 2.00                     | 0.42              |
| 5:5D:525:ILE:O     | 5:5D:526:ASN:C     | 2.62                     | 0.42              |
| 5:5D:1074:GLY:CA   | 35:4N:71:THR:HG23  | 2.49                     | 0.42              |
| 25:4D:384:GLU:OE1  | 25:4D:395:SER:OG   | 2.36                     | 0.42              |
| 28:4G:309:PRO:N    | 28:4G:310:PRO:CD   | 2.82                     | 0.42              |
| 28:4G:773:ASN:HB2  | 28:4G:774:PRO:HA   | 2.00                     | 0.42              |
| 37:2A:107:A:N1     | 37:2A:108:G:C5     | 2.88                     | 0.42              |
| 43:2G:981:TYR:O    | 43:2G:983:GLY:N    | 2.53                     | 0.42              |
| 47:2K:51:GLY:HA3   | 47:2K:56:THR:O     | 2.19                     | 0.42              |
| 49:2M:62:ALA:O     | 49:2M:63:ARG:C     | 2.62                     | 0.42              |
| 3:5B:679:SER:O     | 3:5B:680:HIS:C     | 2.61                     | 0.42              |
| 4:5C:509:VAL:O     | 4:5C:522:SER:HA    | 2.19                     | 0.42              |
| 5:5D:495:THR:HG22  | 5:5D:496:ASP:N     | 2.35                     | 0.42              |
| 5:5D:642:THR:O     | 5:5D:642:THR:HG22  | 2.19                     | 0.42              |
| 5:5D:1857:ASN:OD1  | 5:5D:1857:ASN:C    | 2.62                     | 0.42              |
| 22:4A:110:G:O5'    | 22:4A:110:G:C8     | 2.70                     | 0.42              |
| 22:4A:119:A:H5''   | 10:4d:38:GLY:O     | 2.19                     | 0.42              |
| 23:4B:568:TYR:O    | 23:4B:641:ARG:NH2  | 2.53                     | 0.42              |
| 37:2A:142:C:O2'    | 37:2A:143:A:H5'    | 2.18                     | 0.42              |
| 43:2G:632:PHE:O    | 43:2G:633:ALA:C    | 2.59                     | 0.42              |
| 43:2G:950:GLN:O    | 43:2G:951:ALA:C    | 2.61                     | 0.42              |
| 1:A:37:C:O2'       | 1:A:38:C:O4'       | 2.38                     | 0.42              |
| 3:5B:122:ILE:HD12  | 3:5B:122:ILE:HA    | 1.94                     | 0.42              |
| 3:5B:173:GLU:OE2   | 33:4L:164:ARG:NH1  | 2.52                     | 0.42              |
| 3:5B:599:MET:HE3   | 3:5B:599:MET:HA    | 2.01                     | 0.42              |
| 3:5B:2298:LEU:HD21 | 5:5D:1265:GLN:OE1  | 2.19                     | 0.42              |
| 22:4A:119:A:H5''   | 10:4d:38:GLY:C     | 2.44                     | 0.42              |
| 24:4C:184:TYR:OH   | 24:4C:188:ARG:NH1  | 2.49                     | 0.42              |
| 26:4E:87:GLN:NE2   | 40:2D:426:GLN:OE1  | 2.51                     | 0.42              |
| 28:4G:891:GLU:HA   | 28:4G:894:GLN:OE1  | 2.19                     | 0.42              |
| 31:4J:250:SER:OG   | 31:4J:252:ARG:NH1  | 2.53                     | 0.42              |
| 38:2B:160:LYS:O    | 38:2B:161:MET:C    | 2.63                     | 0.42              |
| 2:5A:95:G:C1'      | 10:5d:24:LYS:CA    | 2.80                     | 0.42              |
| 3:5B:707:ARG:HG2   | 3:5B:707:ARG:HH11  | 1.84                     | 0.42              |
| 4:5C:758:LEU:N     | 4:5C:758:LEU:HD22  | 2.35                     | 0.42              |
| 5:5D:1936:LEU:HD23 | 5:5D:1936:LEU:C    | 2.43                     | 0.42              |
| 5:5D:2098:ALA:C    | 5:5D:2099:THR:HG22 | 2.45                     | 0.42              |
| 29:4H:158:PRO:O    | 29:4H:165:PRO:HA   | 2.20                     | 0.42              |
| 34:4M:28:LYS:NZ    | 34:4M:42:ILE:O     | 2.37                     | 0.42              |
| 37:2A:157:G:H2'    | 37:2A:158:G:O4'    | 2.19                     | 0.42              |
| 43:2G:574:ILE:O    | 43:2G:575:LEU:C    | 2.63                     | 0.42              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 43:2G:1205:GLU:O   | 43:2G:1206:ASP:C   | 2.61                     | 0.42              |
| 43:2G:1279:ALA:O   | 43:2G:1280:LEU:C   | 2.60                     | 0.42              |
| 1:A:33:U:O2'       | 1:A:34:G:C8        | 2.70                     | 0.42              |
| 3:5B:472:LEU:O     | 3:5B:473:PHE:HB2   | 2.20                     | 0.42              |
| 3:5B:513:LEU:HG    | 3:5B:513:LEU:O     | 2.20                     | 0.42              |
| 3:5B:1139:ARG:HA   | 3:5B:1186:LEU:HD11 | 2.02                     | 0.42              |
| 3:5B:1434:LYS:O    | 3:5B:1439:ARG:NH2  | 2.47                     | 0.42              |
| 3:5B:2233:SER:O    | 3:5B:2236:GLU:HG3  | 2.20                     | 0.42              |
| 4:5C:363:SER:O     | 4:5C:364:SER:OG    | 2.27                     | 0.42              |
| 4:5C:560:VAL:HG12  | 4:5C:561:LYS:H     | 1.85                     | 0.42              |
| 4:5C:845:ALA:O     | 4:5C:846:VAL:C     | 2.61                     | 0.42              |
| 5:5D:467:LEU:HD12  | 5:5D:467:LEU:H     | 1.84                     | 0.42              |
| 5:5D:1613:LEU:CD1  | 5:5D:1641:ILE:HG21 | 2.50                     | 0.42              |
| 5:5D:1943:MET:HE3  | 5:5D:2109:MET:HB2  | 2.01                     | 0.42              |
| 23:4B:393:TYR:CD1  | 23:4B:393:TYR:C    | 2.97                     | 0.42              |
| 33:4L:42:LEU:O     | 33:4L:80:ILE:HD11  | 2.19                     | 0.42              |
| 43:2G:710:ALA:O    | 43:2G:711:ALA:C    | 2.61                     | 0.42              |
| 43:2G:1078:VAL:O   | 43:2G:1079:ASN:C   | 2.63                     | 0.42              |
| 43:2G:1115:ALA:O   | 43:2G:1116:ILE:C   | 2.61                     | 0.42              |
| 1:A:22:C:H2'       | 1:A:23:G:C5'       | 2.49                     | 0.42              |
| 3:5B:214:ARG:HB3   | 3:5B:214:ARG:NH1   | 2.35                     | 0.42              |
| 3:5B:1911:GLU:HA   | 3:5B:1911:GLU:OE2  | 2.20                     | 0.42              |
| 5:5D:514:LEU:HD22  | 5:5D:558:ARG:HD3   | 2.01                     | 0.42              |
| 5:5D:938:ILE:HD11  | 5:5D:952:ARG:HG2   | 2.01                     | 0.42              |
| 5:5D:1369:LEU:HD23 | 5:5D:1369:LEU:C    | 2.45                     | 0.42              |
| 5:5D:1847:GLU:OE1  | 5:5D:1847:GLU:C    | 2.63                     | 0.42              |
| 24:4C:458:GLU:OE1  | 24:4C:461:HIS:HB3  | 2.20                     | 0.42              |
| 25:4D:292:ALA:O    | 25:4D:293:ARG:C    | 2.62                     | 0.42              |
| 28:4G:369:LEU:O    | 28:4G:371:GLN:N    | 2.50                     | 0.42              |
| 33:4L:145:ASP:CG   | 33:4L:146:GLU:OE2  | 2.63                     | 0.42              |
| 37:2A:155:C:H2'    | 37:2A:156:U:H5''   | 2.02                     | 0.42              |
| 40:2D:420:ILE:HD11 | 40:2D:425:MET:HA   | 2.01                     | 0.42              |
| 43:2G:854:VAL:C    | 43:2G:856:ASP:H    | 2.28                     | 0.42              |
| 43:2G:997:LEU:O    | 43:2G:998:LYS:C    | 2.62                     | 0.42              |
| 44:2H:805:ILE:HG12 | 44:2H:806:TYR:N    | 2.34                     | 0.42              |
| 1:A:20:U:H5''      | 1:A:20:U:H6        | 1.85                     | 0.42              |
| 2:5A:18:C:H2'      | 2:5A:19:A:O4'      | 2.19                     | 0.42              |
| 4:5C:258:ASN:OD1   | 4:5C:259:LYS:N     | 2.50                     | 0.42              |
| 4:5C:932:GLU:OE2   | 4:5C:936:LYS:NZ    | 2.37                     | 0.42              |
| 5:5D:625:GLY:N     | 5:5D:626:PRO:CD    | 2.83                     | 0.42              |
| 28:4G:862:GLU:C    | 28:4G:862:GLU:OE1  | 2.63                     | 0.42              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 35:4N:84:VAL:O     | 35:4N:85:CYS:SG    | 2.77                     | 0.42              |
| 36:4Z:334:HIS:HA   | 36:4Z:342:LEU:N    | 2.34                     | 0.42              |
| 43:2G:887:LYS:O    | 43:2G:888:LEU:C    | 2.63                     | 0.42              |
| 45:2I:1211:ILE:O   | 45:2I:1212:ARG:C   | 2.62                     | 0.42              |
| 1:A:10:C:C2        | 1:A:10:C:OP2       | 2.73                     | 0.42              |
| 3:5B:1997:VAL:HG12 | 3:5B:1998:ASN:N    | 2.35                     | 0.42              |
| 3:5B:2286:VAL:O    | 3:5B:2286:VAL:HG22 | 2.20                     | 0.42              |
| 4:5C:530:LEU:HD21  | 4:5C:544:VAL:HG21  | 2.01                     | 0.42              |
| 4:5C:553:GLU:OE2   | 4:5C:554:GLY:N     | 2.53                     | 0.42              |
| 5:5D:573:HIS:C     | 5:5D:575:LEU:H     | 2.27                     | 0.42              |
| 5:5D:690:VAL:HG11  | 5:5D:707:ILE:HD13  | 2.01                     | 0.42              |
| 5:5D:692:ILE:HG21  | 5:5D:700:ARG:HG3   | 2.02                     | 0.42              |
| 22:4A:74:C:N3      | 22:4A:75:C:N4      | 2.68                     | 0.42              |
| 31:4J:352:GLU:C    | 31:4J:353:GLN:OE1  | 2.63                     | 0.42              |
| 36:4Z:241:TRP:HA   | 36:4Z:248:ILE:HA   | 2.01                     | 0.42              |
| 42:2F:34:ARG:O     | 42:2F:35:ASP:C     | 2.62                     | 0.42              |
| 43:2G:704:ILE:O    | 43:2G:705:SER:C    | 2.61                     | 0.42              |
| 43:2G:806:ILE:O    | 43:2G:807:LYS:C    | 2.62                     | 0.42              |
| 46:2J:77:ILE:O     | 46:2J:84:ILE:CA    | 2.68                     | 0.42              |
| 2:5A:93:U:C4'      | 9:5c:104:ASP:CA    | 2.97                     | 0.41              |
| 2:5A:116:U:OP2     | 11:5e:68:THR:CA    | 2.67                     | 0.41              |
| 3:5B:783:TYR:CD1   | 3:5B:783:TYR:C     | 2.98                     | 0.41              |
| 3:5B:2306:HIS:CD2  | 3:5B:2308:VAL:HG22 | 2.55                     | 0.41              |
| 4:5C:134:LEU:CD2   | 4:5C:202:ILE:HG23  | 2.49                     | 0.41              |
| 4:5C:617:LEU:HD11  | 4:5C:629:ILE:CG2   | 2.50                     | 0.41              |
| 25:4D:222:ILE:HG22 | 25:4D:223:ILE:HG23 | 2.01                     | 0.41              |
| 37:2A:103:U:C3'    | 37:2A:104:U:H5'    | 2.50                     | 0.41              |
| 43:2G:91:LEU:O     | 43:2G:94:ILE:N     | 2.53                     | 0.41              |
| 43:2G:862:GLU:O    | 43:2G:864:TYR:N    | 2.53                     | 0.41              |
| 43:2G:1038:LEU:O   | 43:2G:1039:VAL:C   | 2.62                     | 0.41              |
| 1:A:30:C:C5        | 1:A:31:C:H5        | 2.32                     | 0.41              |
| 3:5B:409:ARG:HA    | 3:5B:412:ASN:OD1   | 2.20                     | 0.41              |
| 3:5B:2190:PRO:HA   | 3:5B:2193:VAL:HG12 | 2.01                     | 0.41              |
| 4:5C:133:THR:HG21  | 4:5C:219:LEU:HD23  | 2.03                     | 0.41              |
| 4:5C:637:LEU:O     | 4:5C:641:MET:HG2   | 2.20                     | 0.41              |
| 5:5D:641:MET:HG2   | 5:5D:1582:ALA:CB   | 2.50                     | 0.41              |
| 5:5D:1166:ARG:CZ   | 5:5D:1166:ARG:HB2  | 2.49                     | 0.41              |
| 5:5D:1536:GLN:O    | 5:5D:1540:LEU:HG   | 2.20                     | 0.41              |
| 5:5D:1970:HIS:ND1  | 5:5D:1974:CYS:SG   | 2.89                     | 0.41              |
| 22:4A:107:U:H2'    | 22:4A:108:C:H6     | 1.85                     | 0.41              |
| 36:4Z:146:ALA:O    | 36:4Z:150:ALA:CB   | 2.67                     | 0.41              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 36:4Z:240:VAL:O    | 36:4Z:249:ARG:N    | 2.52                     | 0.41              |
| 37:2A:153:A:H62    | 37:2A:177:A:H2     | 1.67                     | 0.41              |
| 43:2G:318:ARG:O    | 43:2G:321:ASP:N    | 2.52                     | 0.41              |
| 43:2G:1169:VAL:O   | 43:2G:1172:LEU:N   | 2.54                     | 0.41              |
| 1:A:108:G:N1       | 3:5B:1551:PHE:O    | 2.50                     | 0.41              |
| 3:5B:422:LEU:N     | 3:5B:422:LEU:HD12  | 2.35                     | 0.41              |
| 3:5B:682:ASP:OD1   | 3:5B:749:TRP:CZ3   | 2.74                     | 0.41              |
| 5:5D:592:LYS:O     | 5:5D:595:ILE:HG22  | 2.19                     | 0.41              |
| 24:4C:223:ASN:OD1  | 24:4C:224:PHE:N    | 2.53                     | 0.41              |
| 33:4L:116:CYS:O    | 33:4L:120:LEU:HB2  | 2.21                     | 0.41              |
| 37:2A:54:U:H5'     | 42:2F:424:ARG:C    | 2.45                     | 0.41              |
| 42:2F:404:ILE:N    | 42:2F:417:ARG:O    | 2.44                     | 0.41              |
| 43:2G:600:LEU:O    | 43:2G:604:ALA:N    | 2.35                     | 0.41              |
| 43:2G:998:LYS:O    | 43:2G:1001:VAL:N   | 2.51                     | 0.41              |
| 43:2G:1082:GLY:O   | 43:2G:1083:TYR:C   | 2.61                     | 0.41              |
| 44:2H:504:TRP:C    | 44:2H:506:PHE:H    | 2.27                     | 0.41              |
| 45:2I:127:GLY:O    | 45:2I:128:ARG:C    | 2.63                     | 0.41              |
| 2:5A:115:C:OP1     | 11:5e:67:LYS:CA    | 2.67                     | 0.41              |
| 4:5C:711:ARG:HB3   | 4:5C:711:ARG:CZ    | 2.51                     | 0.41              |
| 5:5D:1936:LEU:HD21 | 5:5D:1940:LEU:HD11 | 2.02                     | 0.41              |
| 5:5D:2042:GLU:HA   | 5:5D:2087:LYS:HB3  | 2.02                     | 0.41              |
| 28:4G:714:MET:SD   | 28:4G:718:ILE:HD13 | 2.60                     | 0.41              |
| 33:4L:96:PHE:CD1   | 33:4L:96:PHE:N     | 2.88                     | 0.41              |
| 37:2A:63:G:H2'     | 37:2A:64:A:C8      | 2.56                     | 0.41              |
| 2:5A:78:U:O2'      | 2:5A:79:C:H3'      | 2.21                     | 0.41              |
| 3:5B:784:LEU:O     | 3:5B:788:GLN:HG3   | 2.20                     | 0.41              |
| 3:5B:946:GLU:HB2   | 3:5B:950:LEU:HD23  | 2.03                     | 0.41              |
| 3:5B:1560:ILE:HD11 | 3:5B:1577:PHE:CE2  | 2.55                     | 0.41              |
| 5:5D:1351:PRO:HG3  | 5:5D:1516:PRO:HA   | 2.01                     | 0.41              |
| 5:5D:1492:SER:OG   | 5:5D:1493:SER:N    | 2.53                     | 0.41              |
| 5:5D:1665:ASP:O    | 5:5D:1667:GLN:N    | 2.48                     | 0.41              |
| 25:4D:377:ARG:O    | 25:4D:397:GLY:HA3  | 2.20                     | 0.41              |
| 43:2G:86:ALA:O     | 43:2G:89:ALA:CA    | 2.67                     | 0.41              |
| 43:2G:1040:GLY:O   | 43:2G:1041:ARG:C   | 2.63                     | 0.41              |
| 1:A:40:U:O4'       | 1:A:41:U:C5        | 2.72                     | 0.41              |
| 2:5A:90:U:C5       | 13:5g:38:ASN:C     | 2.85                     | 0.41              |
| 4:5C:708:THR:O     | 4:5C:708:THR:HG22  | 2.19                     | 0.41              |
| 5:5D:573:HIS:O     | 5:5D:575:LEU:N     | 2.53                     | 0.41              |
| 5:5D:769:CYS:SG    | 5:5D:771:ASN:N     | 2.93                     | 0.41              |
| 37:2A:152:G:H2'    | 37:2A:153:A:C1'    | 2.51                     | 0.41              |
| 45:2I:1210:ASP:O   | 45:2I:1211:ILE:C   | 2.64                     | 0.41              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 3:5B:232:LEU:HD21  | 3:5B:414:ARG:HD3   | 2.03                     | 0.41              |
| 3:5B:274:PRO:O     | 32:4K:400:THR:HA   | 2.21                     | 0.41              |
| 3:5B:2119:ASP:OD2  | 3:5B:2305:TYR:OH   | 2.39                     | 0.41              |
| 24:4C:266:LEU:C    | 24:4C:267:HIS:CG   | 2.98                     | 0.41              |
| 27:4F:48:ILE:CG2   | 27:4F:109:LYS:HB2  | 2.50                     | 0.41              |
| 32:4K:336:LYS:NZ   | 32:4K:367:ASP:O    | 2.46                     | 0.41              |
| 43:2G:301:ARG:O    | 43:2G:302:ASP:C    | 2.63                     | 0.41              |
| 43:2G:594:ARG:O    | 43:2G:595:GLU:C    | 2.61                     | 0.41              |
| 1:A:113:U:H4'      | 30:4I:20:ILE:HD13  | 2.01                     | 0.41              |
| 3:5B:986:GLU:OE1   | 3:5B:986:GLU:N     | 2.53                     | 0.41              |
| 3:5B:1268:ILE:O    | 3:5B:1272:THR:OG1  | 2.30                     | 0.41              |
| 4:5C:366:GLN:HG2   | 4:5C:370:VAL:HG11  | 2.02                     | 0.41              |
| 4:5C:668:GLU:O     | 4:5C:823:ALA:HB1   | 2.21                     | 0.41              |
| 5:5D:699:LYS:HD2   | 5:5D:699:LYS:HA    | 1.92                     | 0.41              |
| 28:4G:108:LEU:HD12 | 28:4G:108:LEU:HA   | 1.97                     | 0.41              |
| 37:2A:112:G:O5'    | 37:2A:112:G:H8     | 2.04                     | 0.41              |
| 43:2G:1182:LEU:O   | 43:2G:1183:VAL:C   | 2.63                     | 0.41              |
| 45:2I:1143:HIS:O   | 45:2I:1144:VAL:C   | 2.64                     | 0.41              |
| 1:A:103:A:H2'      | 1:A:104:C:O4'      | 2.21                     | 0.41              |
| 3:5B:150:MET:CE    | 3:5B:153:ARG:HE    | 2.33                     | 0.41              |
| 3:5B:758:ARG:HD3   | 3:5B:779:LEU:HD11  | 2.02                     | 0.41              |
| 3:5B:2123:GLN:HB2  | 3:5B:2157:VAL:HG13 | 2.03                     | 0.41              |
| 4:5C:240:GLU:HA    | 4:5C:243:ILE:HG12  | 2.02                     | 0.41              |
| 4:5C:911:PRO:O     | 4:5C:934:MET:HE3   | 2.20                     | 0.41              |
| 5:5D:488:LEU:HD12  | 5:5D:488:LEU:C     | 2.46                     | 0.41              |
| 5:5D:1375:ARG:NH1  | 5:5D:1447:ASN:O    | 2.54                     | 0.41              |
| 5:5D:1631:LEU:HD23 | 5:5D:1631:LEU:C    | 2.46                     | 0.41              |
| 5:5D:1748:LYS:NZ   | 5:5D:1790:GLU:OE1  | 2.46                     | 0.41              |
| 5:5D:1920:ILE:HG22 | 5:5D:1924:GLN:OE1  | 2.21                     | 0.41              |
| 5:5D:1943:MET:HE3  | 5:5D:2109:MET:CB   | 2.51                     | 0.41              |
| 5:5D:2098:ALA:O    | 5:5D:2099:THR:CG2  | 2.68                     | 0.41              |
| 6:5E:255:MET:O     | 6:5E:257:ASN:N     | 2.54                     | 0.41              |
| 19:6e:45:LEU:N     | 19:6e:63:ALA:O     | 2.37                     | 0.41              |
| 23:4B:419:GLU:OE1  | 24:4C:167:TYR:OH   | 2.31                     | 0.41              |
| 37:2A:152:G:H2'    | 37:2A:152:G:N3     | 2.36                     | 0.41              |
| 37:2A:171:U:H2'    | 37:2A:172:C:O4'    | 2.21                     | 0.41              |
| 43:2G:647:PHE:O    | 43:2G:648:LEU:C    | 2.63                     | 0.41              |
| 43:2G:712:LEU:O    | 43:2G:713:ALA:C    | 2.64                     | 0.41              |
| 43:2G:750:ILE:O    | 43:2G:751:GLY:C    | 2.63                     | 0.41              |
| 43:2G:1018:PRO:O   | 43:2G:1019:ARG:C   | 2.63                     | 0.41              |
| 45:2I:811:THR:C    | 45:2I:813:ALA:N    | 2.78                     | 0.41              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 2:5A:49:A:C5       | 2:5A:50:G:N7       | 2.89                     | 0.41              |
| 4:5C:150:ILE:HD12  | 4:5C:535:ALA:HB2   | 2.03                     | 0.41              |
| 5:5D:526:ASN:O     | 5:5D:527:MET:C     | 2.64                     | 0.41              |
| 5:5D:1036:GLU:OE1  | 5:5D:1075:PHE:HA   | 2.21                     | 0.41              |
| 25:4D:189:GLU:C    | 25:4D:189:GLU:OE2  | 2.63                     | 0.41              |
| 37:2A:149:A:C6     | 37:2A:150:U:C4     | 3.09                     | 0.41              |
| 43:2G:758:ASP:O    | 43:2G:761:TYR:N    | 2.54                     | 0.41              |
| 44:2H:596:GLU:C    | 44:2H:598:GLU:N    | 2.67                     | 0.41              |
| 45:2I:437:VAL:O    | 45:2I:776:GLN:CA   | 2.69                     | 0.41              |
| 3:5B:104:GLU:HG2   | 3:5B:422:LEU:HD11  | 2.02                     | 0.40              |
| 3:5B:696:MET:HE3   | 3:5B:696:MET:HB3   | 1.99                     | 0.40              |
| 3:5B:1911:GLU:O    | 3:5B:1912:PRO:C    | 2.64                     | 0.40              |
| 4:5C:249:GLU:OE1   | 4:5C:448:LYS:NZ    | 2.51                     | 0.40              |
| 4:5C:722:TYR:O     | 4:5C:723:ASP:OD1   | 2.39                     | 0.40              |
| 5:5D:730:GLU:OE2   | 5:5D:829:LYS:NZ    | 2.50                     | 0.40              |
| 5:5D:1006:LYS:O    | 5:5D:1107:LEU:HD22 | 2.21                     | 0.40              |
| 5:5D:1165:ILE:O    | 5:5D:1165:ILE:HG22 | 2.22                     | 0.40              |
| 23:4B:500:VAL:O    | 23:4B:504:MET:HG3  | 2.20                     | 0.40              |
| 32:4K:382:ASN:O    | 32:4K:383:PHE:C    | 2.64                     | 0.40              |
| 42:2F:184:ARG:CA   | 7:2a:85:PRO:C      | 2.94                     | 0.40              |
| 43:2G:301:ARG:O    | 43:2G:304:PRO:N    | 2.54                     | 0.40              |
| 43:2G:771:LEU:O    | 43:2G:772:ILE:C    | 2.65                     | 0.40              |
| 43:2G:1149:LYS:O   | 43:2G:1150:SER:C   | 2.63                     | 0.40              |
| 45:2I:672:GLY:N    | 45:2I:697:ARG:O    | 2.54                     | 0.40              |
| 3:5B:655:LEU:HD12  | 3:5B:655:LEU:HA    | 1.98                     | 0.40              |
| 4:5C:678:THR:O     | 4:5C:679:PRO:C     | 2.64                     | 0.40              |
| 5:5D:782:PHE:N     | 5:5D:782:PHE:CD1   | 2.89                     | 0.40              |
| 5:5D:1382:MET:HE2  | 5:5D:1652:TRP:CG   | 2.56                     | 0.40              |
| 5:5D:1598:ILE:N    | 5:5D:1599:PRO:CD   | 2.85                     | 0.40              |
| 22:4A:38:U:H4'     | 22:4A:39:A:OP1     | 2.21                     | 0.40              |
| 25:4D:193:MET:O    | 25:4D:196:GLU:HG2  | 2.21                     | 0.40              |
| 28:4G:371:GLN:N    | 28:4G:371:GLN:OE1  | 2.54                     | 0.40              |
| 33:4L:21:VAL:HG13  | 33:4L:160:ILE:HD11 | 2.04                     | 0.40              |
| 43:2G:706:ALA:O    | 43:2G:707:LEU:C    | 2.61                     | 0.40              |
| 49:2M:52:TYR:O     | 49:2M:53:PHE:C     | 2.62                     | 0.40              |
| 3:5B:651:TRP:HZ3   | 3:5B:652:LEU:HD23  | 1.85                     | 0.40              |
| 3:5B:1863:VAL:HG11 | 3:5B:1868:MET:HB3  | 2.03                     | 0.40              |
| 3:5B:2083:LEU:HD21 | 3:5B:2218:PHE:CE2  | 2.56                     | 0.40              |
| 4:5C:750:LEU:HD23  | 4:5C:750:LEU:C     | 2.46                     | 0.40              |
| 5:5D:537:LYS:NZ    | 5:5D:583:THR:O     | 2.53                     | 0.40              |
| 5:5D:1437:ARG:CD   | 5:5D:1738:ALA:HB1  | 2.52                     | 0.40              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 5:5D:1559:VAL:N    | 5:5D:1642:GLN:O    | 2.49                     | 0.40              |
| 5:5D:1962:GLN:OE1  | 5:5D:2114:MET:N    | 2.48                     | 0.40              |
| 5:5D:1988:MET:HE1  | 5:5D:1996:LEU:HD13 | 2.03                     | 0.40              |
| 22:4A:33:A:H2'     | 22:4A:34:G:O4'     | 2.20                     | 0.40              |
| 43:2G:951:ALA:O    | 43:2G:952:ALA:C    | 2.61                     | 0.40              |
| 43:2G:1169:VAL:O   | 43:2G:1170:THR:C   | 2.65                     | 0.40              |
| 9:2c:62:HIS:O      | 9:2c:103:GLY:HA3   | 2.21                     | 0.40              |
| 3:5B:186:GLU:N     | 3:5B:186:GLU:OE1   | 2.54                     | 0.40              |
| 3:5B:804:GLU:OE1   | 3:5B:804:GLU:N     | 2.51                     | 0.40              |
| 4:5C:713:LYS:HE3   | 4:5C:713:LYS:HA    | 2.02                     | 0.40              |
| 5:5D:518:LEU:O     | 5:5D:522:GLY:N     | 2.52                     | 0.40              |
| 5:5D:530:THR:HB    | 5:5D:531:ILE:HD12  | 2.03                     | 0.40              |
| 5:5D:531:ILE:HG22  | 5:5D:532:ASN:N     | 2.37                     | 0.40              |
| 5:5D:792:VAL:O     | 5:5D:795:THR:HG22  | 2.22                     | 0.40              |
| 5:5D:1946:ALA:O    | 5:5D:1950:THR:HG23 | 2.20                     | 0.40              |
| 14:6A:68:C:P       | 23:4B:520:LEU:HD11 | 2.62                     | 0.40              |
| 31:4J:352:GLU:O    | 31:4J:353:GLN:C    | 2.65                     | 0.40              |
| 37:2A:183:G:C6     | 37:2A:184:C:N4     | 2.89                     | 0.40              |
| 43:2G:899:ALA:O    | 43:2G:900:PHE:C    | 2.64                     | 0.40              |
| 10:2d:5:LEU:O      | 11:2e:49:GLY:HA3   | 2.21                     | 0.40              |
| 2:5A:107:U:H2'     | 2:5A:108:G:O4'     | 2.22                     | 0.40              |
| 3:5B:911:VAL:HG12  | 3:5B:912:GLU:N     | 2.35                     | 0.40              |
| 3:5B:984:MET:HE3   | 3:5B:1048:MET:CE   | 2.51                     | 0.40              |
| 5:5D:432:ASP:OD1   | 5:5D:433:GLY:N     | 2.52                     | 0.40              |
| 5:5D:498:ASN:OD1   | 5:5D:498:ASN:N     | 2.55                     | 0.40              |
| 5:5D:1214:VAL:HG23 | 5:5D:1215:HIS:N    | 2.36                     | 0.40              |
| 5:5D:1240:LEU:C    | 5:5D:1240:LEU:HD23 | 2.47                     | 0.40              |
| 5:5D:1860:ILE:HD12 | 5:5D:1890:LYS:HD3  | 2.04                     | 0.40              |
| 9:5c:62:HIS:O      | 9:5c:103:GLY:HA3   | 2.21                     | 0.40              |
| 24:4C:459:PRO:HB2  | 24:4C:460:ILE:H    | 1.71                     | 0.40              |
| 37:2A:160:A:H2'    | 37:2A:161:U:O4'    | 2.22                     | 0.40              |
| 43:2G:705:SER:O    | 43:2G:708:ALA:N    | 2.55                     | 0.40              |
| 43:2G:750:ILE:O    | 43:2G:753:LEU:N    | 2.54                     | 0.40              |
| 43:2G:1062:LEU:O   | 43:2G:1064:GLU:N   | 2.54                     | 0.40              |
| 43:2G:1187:THR:O   | 43:2G:1188:ALA:C   | 2.64                     | 0.40              |
| 43:2G:1188:ALA:O   | 43:2G:1189:SER:C   | 2.63                     | 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 |     |
|-----|-------|-----------------|------------|---------|----------|-------------|-----|
| 3   | 5B    | 2249/2335 (96%) | 2156 (96%) | 93 (4%) | 0        | 100         | 100 |
| 4   | 5C    | 814/972 (84%)   | 755 (93%)  | 58 (7%) | 1 (0%)   | 48          | 73  |
| 5   | 5D    | 1694/2136 (79%) | 1618 (96%) | 75 (4%) | 1 (0%)   | 48          | 73  |
| 6   | 5E    | 297/357 (83%)   | 272 (92%)  | 16 (5%) | 9 (3%)   | 3           | 9   |
| 7   | 2a    | 84/231 (36%)    | 82 (98%)   | 2 (2%)  | 0        | 100         | 100 |
| 7   | 4a    | 60/231 (26%)    | 57 (95%)   | 3 (5%)  | 0        | 100         | 100 |
| 7   | 5a    | 82/231 (36%)    | 80 (98%)   | 2 (2%)  | 0        | 100         | 100 |
| 8   | 2b    | 80/119 (67%)    | 77 (96%)   | 3 (4%)  | 0        | 100         | 100 |
| 8   | 4b    | 80/119 (67%)    | 76 (95%)   | 4 (5%)  | 0        | 100         | 100 |
| 8   | 5b    | 80/119 (67%)    | 77 (96%)   | 3 (4%)  | 0        | 100         | 100 |
| 9   | 2c    | 81/118 (69%)    | 78 (96%)   | 3 (4%)  | 0        | 100         | 100 |
| 9   | 4c    | 70/118 (59%)    | 68 (97%)   | 2 (3%)  | 0        | 100         | 100 |
| 9   | 5c    | 95/118 (80%)    | 91 (96%)   | 4 (4%)  | 0        | 100         | 100 |
| 10  | 2d    | 72/86 (84%)     | 68 (94%)   | 4 (6%)  | 0        | 100         | 100 |
| 10  | 4d    | 69/86 (80%)     | 67 (97%)   | 2 (3%)  | 0        | 100         | 100 |
| 10  | 5d    | 72/86 (84%)     | 69 (96%)   | 3 (4%)  | 0        | 100         | 100 |
| 11  | 2e    | 77/92 (84%)     | 76 (99%)   | 1 (1%)  | 0        | 100         | 100 |
| 11  | 4e    | 76/92 (83%)     | 70 (92%)   | 6 (8%)  | 0        | 100         | 100 |
| 11  | 5e    | 77/92 (84%)     | 76 (99%)   | 1 (1%)  | 0        | 100         | 100 |
| 12  | 2f    | 64/76 (84%)     | 62 (97%)   | 2 (3%)  | 0        | 100         | 100 |
| 12  | 4f    | 71/76 (93%)     | 67 (94%)   | 4 (6%)  | 0        | 100         | 100 |
| 12  | 5f    | 70/76 (92%)     | 68 (97%)   | 2 (3%)  | 0        | 100         | 100 |
| 13  | 2g    | 76/126 (60%)    | 75 (99%)   | 1 (1%)  | 0        | 100         | 100 |
| 13  | 4g    | 69/126 (55%)    | 69 (100%)  | 0       | 0        | 100         | 100 |
| 13  | 5g    | 75/126 (60%)    | 73 (97%)   | 2 (3%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed        | Favoured   | Allowed   | Outliers | Percentiles |     |
|-----|-------|-----------------|------------|-----------|----------|-------------|-----|
| 15  | 6a    | 88/95 (93%)     | 77 (88%)   | 7 (8%)    | 4 (4%)   | 2           | 4   |
| 16  | 6b    | 70/102 (69%)    | 64 (91%)   | 3 (4%)    | 3 (4%)   | 2           | 4   |
| 17  | 6c    | 70/139 (50%)    | 63 (90%)   | 6 (9%)    | 1 (1%)   | 9           | 24  |
| 18  | 6d    | 68/91 (75%)     | 63 (93%)   | 4 (6%)    | 1 (2%)   | 8           | 22  |
| 19  | 6e    | 68/80 (85%)     | 64 (94%)   | 2 (3%)    | 2 (3%)   | 3           | 9   |
| 20  | 6f    | 61/103 (59%)    | 56 (92%)   | 5 (8%)    | 0        | 100         | 100 |
| 21  | 6g    | 57/96 (59%)     | 52 (91%)   | 4 (7%)    | 1 (2%)   | 7           | 18  |
| 23  | 4B    | 248/683 (36%)   | 235 (95%)  | 13 (5%)   | 0        | 100         | 100 |
| 24  | 4C    | 422/522 (81%)   | 393 (93%)  | 28 (7%)   | 1 (0%)   | 44          | 68  |
| 25  | 4D    | 372/499 (74%)   | 353 (95%)  | 19 (5%)   | 0        | 100         | 100 |
| 26  | 4E    | 122/128 (95%)   | 115 (94%)  | 7 (6%)    | 0        | 100         | 100 |
| 27  | 4F    | 139/142 (98%)   | 134 (96%)  | 5 (4%)    | 0        | 100         | 100 |
| 28  | 4G    | 795/941 (84%)   | 747 (94%)  | 48 (6%)   | 0        | 100         | 100 |
| 29  | 4H    | 167/177 (94%)   | 158 (95%)  | 9 (5%)    | 0        | 100         | 100 |
| 30  | 4I    | 73/376 (19%)    | 73 (100%)  | 0         | 0        | 100         | 100 |
| 31  | 4J    | 142/800 (18%)   | 136 (96%)  | 6 (4%)    | 0        | 100         | 100 |
| 32  | 4K    | 184/439 (42%)   | 174 (95%)  | 10 (5%)   | 0        | 100         | 100 |
| 33  | 4L    | 173/312 (55%)   | 165 (95%)  | 6 (4%)    | 2 (1%)   | 11          | 28  |
| 34  | 4M    | 71/73 (97%)     | 66 (93%)   | 5 (7%)    | 0        | 100         | 100 |
| 35  | 4N    | 78/199 (39%)    | 77 (99%)   | 0         | 1 (1%)   | 10          | 26  |
| 36  | 4Z    | 414/513 (81%)   | 401 (97%)  | 12 (3%)   | 1 (0%)   | 44          | 68  |
| 38  | 2B    | 160/255 (63%)   | 146 (91%)  | 12 (8%)   | 2 (1%)   | 10          | 26  |
| 39  | 2C    | 92/225 (41%)    | 90 (98%)   | 2 (2%)    | 0        | 100         | 100 |
| 40  | 2D    | 196/793 (25%)   | 180 (92%)  | 10 (5%)   | 6 (3%)   | 3           | 8   |
| 41  | 2E    | 88/464 (19%)    | 63 (72%)   | 16 (18%)  | 9 (10%)  | 0           | 0   |
| 42  | 2F    | 413/501 (82%)   | 367 (89%)  | 41 (10%)  | 5 (1%)   | 11          | 28  |
| 43  | 2G    | 1032/1304 (79%) | 844 (82%)  | 166 (16%) | 22 (2%)  | 5           | 15  |
| 44  | 2H    | 199/895 (22%)   | 179 (90%)  | 16 (8%)   | 4 (2%)   | 6           | 16  |
| 45  | 2I    | 1152/1217 (95%) | 1053 (91%) | 89 (8%)   | 10 (1%)  | 14          | 35  |
| 46  | 2J    | 76/424 (18%)    | 75 (99%)   | 1 (1%)    | 0        | 100         | 100 |
| 47  | 2K    | 106/125 (85%)   | 85 (80%)   | 18 (17%)  | 3 (3%)   | 4           | 10  |

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| Mol | Chain | Analysed          | Favoured    | Allowed  | Outliers | Percentiles |     |
|-----|-------|-------------------|-------------|----------|----------|-------------|-----|
| 48  | 2L    | 87/110 (79%)      | 74 (85%)    | 13 (15%) | 0        | 100         | 100 |
| 49  | 2M    | 64/86 (74%)       | 55 (86%)    | 7 (11%)  | 2 (3%)   | 3           | 8   |
| All | All   | 14181/21253 (67%) | 13204 (93%) | 886 (6%) | 91 (1%)  | 24          | 45  |

All (91) Ramachandran outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 5   | 5D    | 1086 | GLN  |
| 6   | 5E    | 193  | THR  |
| 15  | 6a    | 55   | LEU  |
| 16  | 6b    | 84   | MET  |
| 18  | 6d    | 70   | ASP  |
| 19  | 6e    | 52   | VAL  |
| 19  | 6e    | 55   | GLN  |
| 24  | 4C    | 459  | PRO  |
| 36  | 4Z    | 383  | CYS  |
| 40  | 2D    | 301  | PRO  |
| 41  | 2E    | 139  | PRO  |
| 41  | 2E    | 141  | ILE  |
| 41  | 2E    | 146  | MET  |
| 41  | 2E    | 162  | PRO  |
| 41  | 2E    | 165  | ARG  |
| 41  | 2E    | 218  | PRO  |
| 42  | 2F    | 284  | ARG  |
| 43  | 2G    | 208  | PRO  |
| 43  | 2G    | 416  | PRO  |
| 43  | 2G    | 418  | PRO  |
| 43  | 2G    | 456  | VAL  |
| 43  | 2G    | 717  | THR  |
| 43  | 2G    | 941  | ASN  |
| 43  | 2G    | 1107 | GLN  |
| 45  | 2I    | 405  | SER  |
| 45  | 2I    | 919  | SER  |
| 47  | 2K    | 99   | GLN  |
| 47  | 2K    | 105  | LYS  |
| 15  | 6a    | 74   | ALA  |
| 16  | 6b    | 97   | PRO  |
| 17  | 6c    | 12   | ASN  |
| 38  | 2B    | 160  | LYS  |
| 40  | 2D    | 223  | LYS  |
| 40  | 2D    | 280  | VAL  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 42  | 2F    | 277  | THR  |
| 43  | 2G    | 113  | ALA  |
| 43  | 2G    | 1110 | VAL  |
| 44  | 2H    | 597  | PHE  |
| 45  | 2I    | 917  | PRO  |
| 6   | 5E    | 60   | MET  |
| 6   | 5E    | 88   | ARG  |
| 6   | 5E    | 256  | ASP  |
| 33  | 4L    | 39   | CYS  |
| 42  | 2F    | 177  | ARG  |
| 42  | 2F    | 393  | PRO  |
| 44  | 2H    | 510  | TYR  |
| 6   | 5E    | 162  | ARG  |
| 16  | 6b    | 96   | ALA  |
| 38  | 2B    | 32   | PRO  |
| 40  | 2D    | 300  | THR  |
| 43  | 2G    | 112  | ILE  |
| 43  | 2G    | 437  | PRO  |
| 43  | 2G    | 523  | ALA  |
| 43  | 2G    | 909  | VAL  |
| 43  | 2G    | 1006 | MET  |
| 44  | 2H    | 463  | ALA  |
| 44  | 2H    | 574  | ALA  |
| 45  | 2I    | 529  | ALA  |
| 45  | 2I    | 578  | THR  |
| 47  | 2K    | 75   | ASP  |
| 6   | 5E    | 159  | PRO  |
| 15  | 6a    | 73   | PRO  |
| 35  | 4N    | 85   | CYS  |
| 41  | 2E    | 147  | PRO  |
| 41  | 2E    | 217  | PRO  |
| 43  | 2G    | 1047 | ALA  |
| 43  | 2G    | 1075 | ARG  |
| 43  | 2G    | 1186 | GLN  |
| 45  | 2I    | 95   | SER  |
| 45  | 2I    | 229  | GLU  |
| 6   | 5E    | 270  | LYS  |
| 21  | 6g    | 34   | ILE  |
| 33  | 4L    | 65   | ILE  |
| 41  | 2E    | 220  | PRO  |
| 43  | 2G    | 326  | THR  |
| 43  | 2G    | 932  | ILE  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 45  | 2I    | 918  | ARG  |
| 45  | 2I    | 1138 | HIS  |
| 49  | 2M    | 56   | ALA  |
| 6   | 5E    | 149  | GLY  |
| 43  | 2G    | 417  | PRO  |
| 40  | 2D    | 221  | PRO  |
| 43  | 2G    | 223  | THR  |
| 42  | 2F    | 229  | TRP  |
| 45  | 2I    | 1204 | VAL  |
| 4   | 5C    | 439  | PRO  |
| 6   | 5E    | 324  | PRO  |
| 40  | 2D    | 298  | PRO  |
| 43  | 2G    | 1031 | VAL  |
| 49  | 2M    | 64   | VAL  |
| 15  | 6a    | 52   | PRO  |

### 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 |     |
|-----|-------|-----------------|-------------|----------|-------------|-----|
| 3   | 5B    | 2033/2108 (96%) | 1986 (98%)  | 47 (2%)  | 45          | 74  |
| 4   | 5C    | 717/866 (83%)   | 698 (97%)   | 19 (3%)  | 41          | 70  |
| 5   | 5D    | 1517/1908 (80%) | 1513 (100%) | 4 (0%)   | 91          | 97  |
| 23  | 4B    | 225/599 (38%)   | 220 (98%)   | 5 (2%)   | 47          | 76  |
| 24  | 4C    | 362/442 (82%)   | 350 (97%)   | 12 (3%)  | 33          | 62  |
| 25  | 4D    | 299/424 (70%)   | 290 (97%)   | 9 (3%)   | 36          | 65  |
| 26  | 4E    | 108/111 (97%)   | 105 (97%)   | 3 (3%)   | 38          | 68  |
| 27  | 4F    | 129/130 (99%)   | 124 (96%)   | 5 (4%)   | 27          | 56  |
| 28  | 4G    | 417/792 (53%)   | 405 (97%)   | 12 (3%)  | 37          | 67  |
| 29  | 4H    | 10/148 (7%)     | 10 (100%)   | 0        | 100         | 100 |
| 30  | 4I    | 32/333 (10%)    | 31 (97%)    | 1 (3%)   | 35          | 64  |
| 31  | 4J    | 112/681 (16%)   | 110 (98%)   | 2 (2%)   | 54          | 80  |

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| Mol | Chain | Analysed         | Rotameric  | Outliers | Percentiles |     |  |
|-----|-------|------------------|------------|----------|-------------|-----|--|
| 32  | 4K    | 66/395 (17%)     | 63 (96%)   | 3 (4%)   | 23          | 50  |  |
| 33  | 4L    | 159/293 (54%)    | 153 (96%)  | 6 (4%)   | 28          | 56  |  |
| 34  | 4M    | 66/66 (100%)     | 64 (97%)   | 2 (3%)   | 36          | 65  |  |
| 35  | 4N    | 75/181 (41%)     | 70 (93%)   | 5 (7%)   | 13          | 33  |  |
| 36  | 4Z    | 11/450 (2%)      | 11 (100%)  | 0        | 100         | 100 |  |
| 40  | 2D    | 70/709 (10%)     | 69 (99%)   | 1 (1%)   | 62          | 84  |  |
| 44  | 2H    | 26/776 (3%)      | 25 (96%)   | 1 (4%)   | 28          | 56  |  |
| All | All   | 6434/11412 (56%) | 6297 (98%) | 137 (2%) | 49          | 76  |  |

All (137) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 3   | 5B    | 81   | PHE  |
| 3   | 5B    | 87   | VAL  |
| 3   | 5B    | 104  | GLU  |
| 3   | 5B    | 142  | SER  |
| 3   | 5B    | 147  | MET  |
| 3   | 5B    | 183  | LEU  |
| 3   | 5B    | 200  | ASP  |
| 3   | 5B    | 223  | SER  |
| 3   | 5B    | 236  | SER  |
| 3   | 5B    | 248  | ASP  |
| 3   | 5B    | 282  | LEU  |
| 3   | 5B    | 322  | ASN  |
| 3   | 5B    | 330  | THR  |
| 3   | 5B    | 351  | TYR  |
| 3   | 5B    | 353  | ASP  |
| 3   | 5B    | 484  | SER  |
| 3   | 5B    | 527  | VAL  |
| 3   | 5B    | 679  | SER  |
| 3   | 5B    | 779  | LEU  |
| 3   | 5B    | 854  | SER  |
| 3   | 5B    | 866  | LEU  |
| 3   | 5B    | 945  | THR  |
| 3   | 5B    | 946  | GLU  |
| 3   | 5B    | 991  | THR  |
| 3   | 5B    | 1032 | ARG  |
| 3   | 5B    | 1089 | CYS  |
| 3   | 5B    | 1173 | SER  |
| 3   | 5B    | 1176 | SER  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 3   | 5B    | 1303 | LEU  |
| 3   | 5B    | 1377 | SER  |
| 3   | 5B    | 1385 | VAL  |
| 3   | 5B    | 1420 | ASN  |
| 3   | 5B    | 1438 | VAL  |
| 3   | 5B    | 1520 | ASN  |
| 3   | 5B    | 1536 | LEU  |
| 3   | 5B    | 1539 | SER  |
| 3   | 5B    | 1599 | GLN  |
| 3   | 5B    | 1634 | SER  |
| 3   | 5B    | 1638 | ASN  |
| 3   | 5B    | 1697 | SER  |
| 3   | 5B    | 1799 | THR  |
| 3   | 5B    | 1872 | LEU  |
| 3   | 5B    | 2046 | THR  |
| 3   | 5B    | 2056 | THR  |
| 3   | 5B    | 2068 | SER  |
| 3   | 5B    | 2073 | TRP  |
| 3   | 5B    | 2231 | THR  |
| 4   | 5C    | 150  | ILE  |
| 4   | 5C    | 202  | ILE  |
| 4   | 5C    | 301  | SER  |
| 4   | 5C    | 363  | SER  |
| 4   | 5C    | 497  | LEU  |
| 4   | 5C    | 507  | VAL  |
| 4   | 5C    | 532  | ILE  |
| 4   | 5C    | 533  | SER  |
| 4   | 5C    | 534  | VAL  |
| 4   | 5C    | 560  | VAL  |
| 4   | 5C    | 562  | THR  |
| 4   | 5C    | 592  | VAL  |
| 4   | 5C    | 649  | SER  |
| 4   | 5C    | 667  | VAL  |
| 4   | 5C    | 749  | THR  |
| 4   | 5C    | 783  | LEU  |
| 4   | 5C    | 818  | SER  |
| 4   | 5C    | 912  | LEU  |
| 4   | 5C    | 943  | LEU  |
| 5   | 5D    | 778  | LEU  |
| 5   | 5D    | 984  | LEU  |
| 5   | 5D    | 1039 | LYS  |
| 5   | 5D    | 1705 | MET  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 23  | 4B    | 417 | LEU  |
| 23  | 4B    | 515 | ASN  |
| 23  | 4B    | 548 | VAL  |
| 23  | 4B    | 580 | ASN  |
| 23  | 4B    | 675 | SER  |
| 24  | 4C    | 98  | GLN  |
| 24  | 4C    | 206 | THR  |
| 24  | 4C    | 235 | SER  |
| 24  | 4C    | 292 | LYS  |
| 24  | 4C    | 304 | SER  |
| 24  | 4C    | 334 | SER  |
| 24  | 4C    | 378 | SER  |
| 24  | 4C    | 399 | CYS  |
| 24  | 4C    | 430 | THR  |
| 24  | 4C    | 436 | LEU  |
| 24  | 4C    | 460 | ILE  |
| 24  | 4C    | 461 | HIS  |
| 25  | 4D    | 119 | SER  |
| 25  | 4D    | 163 | THR  |
| 25  | 4D    | 168 | SER  |
| 25  | 4D    | 214 | PHE  |
| 25  | 4D    | 260 | SER  |
| 25  | 4D    | 311 | SER  |
| 25  | 4D    | 395 | SER  |
| 25  | 4D    | 398 | HIS  |
| 25  | 4D    | 427 | THR  |
| 26  | 4E    | 81  | VAL  |
| 26  | 4E    | 85  | SER  |
| 26  | 4E    | 122 | SER  |
| 27  | 4F    | 25  | VAL  |
| 27  | 4F    | 80  | THR  |
| 27  | 4F    | 94  | LEU  |
| 27  | 4F    | 132 | SER  |
| 27  | 4F    | 138 | THR  |
| 28  | 4G    | 15  | LEU  |
| 28  | 4G    | 102 | ASP  |
| 28  | 4G    | 108 | LEU  |
| 28  | 4G    | 199 | SER  |
| 28  | 4G    | 205 | THR  |
| 28  | 4G    | 343 | GLU  |
| 28  | 4G    | 357 | THR  |
| 28  | 4G    | 373 | VAL  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 28  | 4G    | 718 | ILE  |
| 28  | 4G    | 750 | SER  |
| 28  | 4G    | 752 | LEU  |
| 28  | 4G    | 921 | ASN  |
| 30  | 4I    | 8   | GLN  |
| 31  | 4J    | 250 | SER  |
| 31  | 4J    | 288 | VAL  |
| 32  | 4K    | 358 | ARG  |
| 32  | 4K    | 359 | ASP  |
| 32  | 4K    | 400 | THR  |
| 33  | 4L    | 24  | ILE  |
| 33  | 4L    | 60  | VAL  |
| 33  | 4L    | 72  | CYS  |
| 33  | 4L    | 74  | THR  |
| 33  | 4L    | 75  | LEU  |
| 33  | 4L    | 108 | ARG  |
| 34  | 4M    | 23  | THR  |
| 34  | 4M    | 49  | THR  |
| 35  | 4N    | 58  | LEU  |
| 35  | 4N    | 61  | LYS  |
| 35  | 4N    | 70  | LYS  |
| 35  | 4N    | 84  | VAL  |
| 35  | 4N    | 88  | VAL  |
| 40  | 2D    | 482 | THR  |
| 44  | 2H    | 803 | THR  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (79) such sidechains are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 3   | 5B    | 65   | HIS  |
| 3   | 5B    | 73   | HIS  |
| 3   | 5B    | 105  | ASN  |
| 3   | 5B    | 229  | GLN  |
| 3   | 5B    | 326  | HIS  |
| 3   | 5B    | 357  | ASN  |
| 3   | 5B    | 434  | HIS  |
| 3   | 5B    | 509  | HIS  |
| 3   | 5B    | 542  | ASN  |
| 3   | 5B    | 654  | ASN  |
| 3   | 5B    | 680  | HIS  |
| 3   | 5B    | 857  | ASN  |
| 3   | 5B    | 1018 | ASN  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 3   | 5B    | 1172 | ASN  |
| 3   | 5B    | 1218 | ASN  |
| 3   | 5B    | 1367 | ASN  |
| 3   | 5B    | 1457 | HIS  |
| 3   | 5B    | 1466 | ASN  |
| 3   | 5B    | 1487 | HIS  |
| 3   | 5B    | 1563 | HIS  |
| 3   | 5B    | 1586 | HIS  |
| 3   | 5B    | 1595 | GLN  |
| 3   | 5B    | 1638 | ASN  |
| 3   | 5B    | 1691 | ASN  |
| 3   | 5B    | 1717 | ASN  |
| 3   | 5B    | 1835 | GLN  |
| 3   | 5B    | 1944 | HIS  |
| 3   | 5B    | 1966 | HIS  |
| 3   | 5B    | 1995 | ASN  |
| 3   | 5B    | 1996 | ASN  |
| 3   | 5B    | 2021 | GLN  |
| 3   | 5B    | 2024 | GLN  |
| 3   | 5B    | 2032 | GLN  |
| 3   | 5B    | 2241 | ASN  |
| 3   | 5B    | 2255 | HIS  |
| 3   | 5B    | 2288 | HIS  |
| 4   | 5C    | 140  | HIS  |
| 4   | 5C    | 245  | HIS  |
| 4   | 5C    | 335  | ASN  |
| 4   | 5C    | 538  | HIS  |
| 4   | 5C    | 627  | HIS  |
| 4   | 5C    | 642  | HIS  |
| 5   | 5D    | 715  | HIS  |
| 5   | 5D    | 785  | HIS  |
| 5   | 5D    | 902  | ASN  |
| 5   | 5D    | 911  | GLN  |
| 5   | 5D    | 1002 | ASN  |
| 5   | 5D    | 1288 | HIS  |
| 5   | 5D    | 1515 | HIS  |
| 5   | 5D    | 1553 | HIS  |
| 5   | 5D    | 1655 | ASN  |
| 5   | 5D    | 1667 | GLN  |
| 5   | 5D    | 1690 | HIS  |
| 5   | 5D    | 1733 | HIS  |
| 5   | 5D    | 1784 | HIS  |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 5   | 5D    | 1896 | GLN  |
| 5   | 5D    | 2003 | GLN  |
| 23  | 4B    | 423  | GLN  |
| 23  | 4B    | 511  | HIS  |
| 24  | 4C    | 282  | HIS  |
| 24  | 4C    | 295  | ASN  |
| 24  | 4C    | 322  | HIS  |
| 24  | 4C    | 479  | HIS  |
| 25  | 4D    | 111  | HIS  |
| 25  | 4D    | 270  | HIS  |
| 25  | 4D    | 376  | ASN  |
| 26  | 4E    | 17   | HIS  |
| 26  | 4E    | 77   | ASN  |
| 26  | 4E    | 87   | GLN  |
| 27  | 4F    | 89   | HIS  |
| 28  | 4G    | 173  | ASN  |
| 28  | 4G    | 308  | HIS  |
| 28  | 4G    | 326  | GLN  |
| 28  | 4G    | 741  | HIS  |
| 28  | 4G    | 773  | ASN  |
| 28  | 4G    | 805  | GLN  |
| 33  | 4L    | 143  | HIS  |
| 33  | 4L    | 153  | HIS  |
| 44  | 2H    | 804  | HIS  |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed      | Backbone Outliers | Pucker Outliers |
|-----|-------|---------------|-------------------|-----------------|
| 1   | A     | 62/144 (43%)  | 37 (59%)          | 12 (19%)        |
| 14  | 6A    | 56/107 (52%)  | 10 (17%)          | 1 (1%)          |
| 2   | 5A    | 114/117 (97%) | 30 (26%)          | 5 (4%)          |
| 22  | 4A    | 124/145 (85%) | 33 (26%)          | 2 (1%)          |
| 37  | 2A    | 105/188 (55%) | 22 (20%)          | 3 (2%)          |
| All | All   | 461/701 (65%) | 132 (28%)         | 23 (4%)         |

All (132) RNA backbone outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 8   | U    |
| 1   | A     | 9   | U    |
| 1   | A     | 10  | C    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 11  | C    |
| 1   | A     | 12  | U    |
| 1   | A     | 13  | U    |
| 1   | A     | 15  | A    |
| 1   | A     | 20  | U    |
| 1   | A     | 21  | U    |
| 1   | A     | 22  | C    |
| 1   | A     | 25  | G    |
| 1   | A     | 29  | A    |
| 1   | A     | 30  | C    |
| 1   | A     | 31  | C    |
| 1   | A     | 32  | C    |
| 1   | A     | 33  | U    |
| 1   | A     | 34  | G    |
| 1   | A     | 35  | U    |
| 1   | A     | 36  | C    |
| 1   | A     | 37  | C    |
| 1   | A     | 39  | U    |
| 1   | A     | 41  | U    |
| 1   | A     | 42  | U    |
| 1   | A     | 44  | U    |
| 1   | A     | 46  | U    |
| 1   | A     | 47  | C    |
| 1   | A     | 48  | C    |
| 1   | A     | 100 | C    |
| 1   | A     | 102 | U    |
| 1   | A     | 103 | A    |
| 1   | A     | 106 | A    |
| 1   | A     | 108 | G    |
| 1   | A     | 110 | G    |
| 1   | A     | 111 | A    |
| 1   | A     | 116 | G    |
| 1   | A     | 117 | G    |
| 1   | A     | 118 | A    |
| 2   | 5A    | 8   | G    |
| 2   | 5A    | 10  | U    |
| 2   | 5A    | 17  | U    |
| 2   | 5A    | 21  | A    |
| 2   | 5A    | 22  | U    |
| 2   | 5A    | 24  | G    |
| 2   | 5A    | 25  | C    |
| 2   | 5A    | 26  | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 2   | 5A    | 28  | A    |
| 2   | 5A    | 35  | U    |
| 2   | 5A    | 36  | C    |
| 2   | 5A    | 40  | U    |
| 2   | 5A    | 45  | C    |
| 2   | 5A    | 52  | U    |
| 2   | 5A    | 68  | C    |
| 2   | 5A    | 69  | A    |
| 2   | 5A    | 78  | U    |
| 2   | 5A    | 79  | C    |
| 2   | 5A    | 80  | U    |
| 2   | 5A    | 83  | A    |
| 2   | 5A    | 88  | A    |
| 2   | 5A    | 89  | U    |
| 2   | 5A    | 90  | U    |
| 2   | 5A    | 92  | U    |
| 2   | 5A    | 93  | U    |
| 2   | 5A    | 94  | U    |
| 2   | 5A    | 95  | G    |
| 2   | 5A    | 96  | A    |
| 2   | 5A    | 97  | G    |
| 2   | 5A    | 109 | G    |
| 14  | 6A    | 36  | A    |
| 14  | 6A    | 46  | G    |
| 14  | 6A    | 47  | A    |
| 14  | 6A    | 48  | A    |
| 14  | 6A    | 49  | G    |
| 14  | 6A    | 51  | U    |
| 14  | 6A    | 77  | C    |
| 14  | 6A    | 78  | A    |
| 14  | 6A    | 103 | U    |
| 14  | 6A    | 104 | U    |
| 22  | 4A    | 2   | G    |
| 22  | 4A    | 25  | A    |
| 22  | 4A    | 26  | G    |
| 22  | 4A    | 37  | C    |
| 22  | 4A    | 38  | U    |
| 22  | 4A    | 39  | A    |
| 22  | 4A    | 40  | U    |
| 22  | 4A    | 45  | G    |
| 22  | 4A    | 53  | U    |
| 22  | 4A    | 54  | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 22  | 4A    | 62  | U    |
| 22  | 4A    | 71  | U    |
| 22  | 4A    | 73  | U    |
| 22  | 4A    | 74  | C    |
| 22  | 4A    | 75  | C    |
| 22  | 4A    | 76  | C    |
| 22  | 4A    | 84  | C    |
| 22  | 4A    | 85  | G    |
| 22  | 4A    | 90  | G    |
| 22  | 4A    | 100 | A    |
| 22  | 4A    | 103 | A    |
| 22  | 4A    | 109 | G    |
| 22  | 4A    | 114 | U    |
| 22  | 4A    | 115 | G    |
| 22  | 4A    | 118 | A    |
| 22  | 4A    | 119 | A    |
| 22  | 4A    | 120 | U    |
| 22  | 4A    | 121 | U    |
| 22  | 4A    | 124 | U    |
| 22  | 4A    | 125 | G    |
| 22  | 4A    | 126 | A    |
| 22  | 4A    | 127 | C    |
| 22  | 4A    | 144 | G    |
| 37  | 2A    | 31  | G    |
| 37  | 2A    | 37  | U    |
| 37  | 2A    | 40  | C    |
| 37  | 2A    | 45  | C    |
| 37  | 2A    | 47  | U    |
| 37  | 2A    | 51  | A    |
| 37  | 2A    | 65  | U    |
| 37  | 2A    | 112 | G    |
| 37  | 2A    | 143 | A    |
| 37  | 2A    | 147 | G    |
| 37  | 2A    | 152 | G    |
| 37  | 2A    | 153 | A    |
| 37  | 2A    | 154 | C    |
| 37  | 2A    | 156 | U    |
| 37  | 2A    | 157 | G    |
| 37  | 2A    | 164 | C    |
| 37  | 2A    | 165 | A    |
| 37  | 2A    | 168 | A    |
| 37  | 2A    | 169 | C    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 37  | 2A    | 177 | A    |
| 37  | 2A    | 178 | A    |
| 37  | 2A    | 179 | C    |

All (23) RNA pucker outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 1   | A     | 9   | U    |
| 1   | A     | 21  | U    |
| 1   | A     | 28  | G    |
| 1   | A     | 33  | U    |
| 1   | A     | 35  | U    |
| 1   | A     | 36  | C    |
| 1   | A     | 38  | C    |
| 1   | A     | 40  | U    |
| 1   | A     | 41  | U    |
| 1   | A     | 99  | C    |
| 1   | A     | 116 | G    |
| 1   | A     | 117 | G    |
| 2   | 5A    | 67  | A    |
| 2   | 5A    | 78  | U    |
| 2   | 5A    | 79  | C    |
| 2   | 5A    | 94  | U    |
| 2   | 5A    | 96  | A    |
| 14  | 6A    | 77  | C    |
| 22  | 4A    | 99  | C    |
| 22  | 4A    | 114 | U    |
| 37  | 2A    | 156 | U    |
| 37  | 2A    | 164 | C    |
| 37  | 2A    | 168 | A    |

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

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

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry

Of 5 ligands modelled in this entry, 3 are monoatomic - leaving 2 for Mogul analysis.

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

| Mol | Type | Chain | Res  | Link | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |      | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 51  | GTP  | 5C    | 1500 | 52   | 26,34,34     | 1.11 | 2 (7%)   | 32,54,54    | 1.53 | 7 (21%)  |
| 50  | IHP  | 5B    | 3000 | -    | 36,36,36     | 0.76 | 0        | 54,60,60    | 1.13 | 2 (3%)   |

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   |
|-----|------|-------|------|------|---------|------------|---------|
| 51  | GTP  | 5C    | 1500 | 52   | -       | 8/18/38/38 | 0/3/3/3 |
| 50  | IHP  | 5B    | 3000 | -    | -       | 3/30/54/54 | 0/1/1/1 |

All (2) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 51  | 5C    | 1500 | GTP  | C5-C6 | -3.96 | 1.39        | 1.47     |
| 51  | 5C    | 1500 | GTP  | C2-N3 | 2.20  | 1.38        | 1.33     |

All (9) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 51  | 5C    | 1500 | GTP  | C5-C6-N1    | 3.27  | 119.73      | 113.95   |
| 51  | 5C    | 1500 | GTP  | PB-O3B-PG   | -3.15 | 122.02      | 132.83   |
| 51  | 5C    | 1500 | GTP  | PA-O3A-PB   | -3.11 | 122.14      | 132.83   |
| 51  | 5C    | 1500 | GTP  | C8-N7-C5    | 3.09  | 108.87      | 102.99   |
| 51  | 5C    | 1500 | GTP  | C2-N1-C6    | -2.91 | 119.73      | 125.10   |
| 51  | 5C    | 1500 | GTP  | C3'-C2'-C1' | 2.79  | 105.18      | 100.98   |
| 50  | 5B    | 3000 | IHP  | C5-C4-C3    | 2.47  | 115.82      | 110.41   |
| 50  | 5B    | 3000 | IHP  | C6-C5-C4    | 2.25  | 115.35      | 110.41   |
| 51  | 5C    | 1500 | GTP  | O6-C6-C5    | -2.10 | 120.28      | 124.37   |

There are no chirality outliers.

All (11) torsion outliers are listed below:

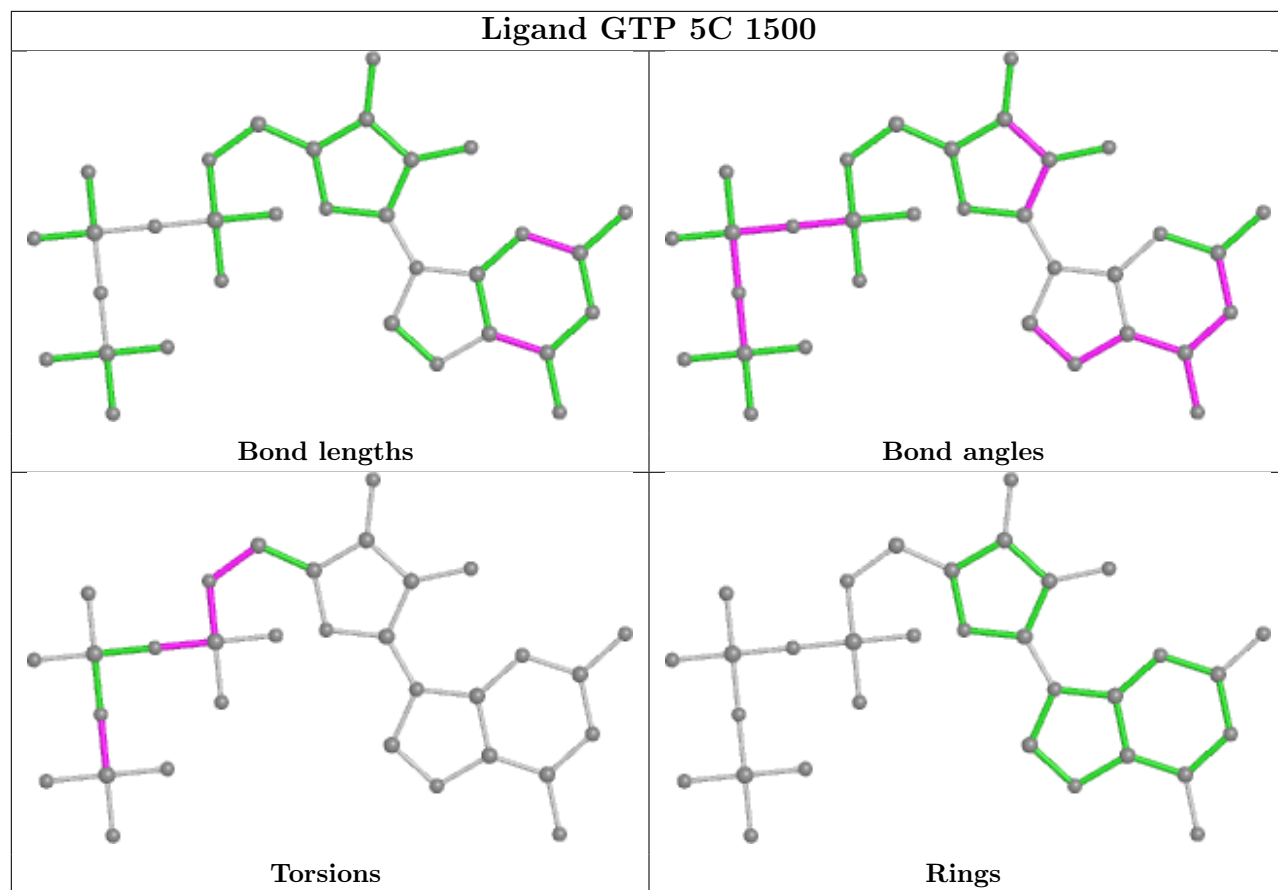
| Mol | Chain | Res  | Type | Atoms          |
|-----|-------|------|------|----------------|
| 50  | 5B    | 3000 | IHP  | C4-O14-P4-O44  |
| 51  | 5C    | 1500 | GTP  | C5'-O5'-PA-O1A |
| 51  | 5C    | 1500 | GTP  | C5'-O5'-PA-O2A |
| 51  | 5C    | 1500 | GTP  | PB-O3A-PA-O5'  |
| 51  | 5C    | 1500 | GTP  | C4'-C5'-O5'-PA |
| 51  | 5C    | 1500 | GTP  | PB-O3B-PG-O1G  |
| 51  | 5C    | 1500 | GTP  | PB-O3B-PG-O2G  |
| 51  | 5C    | 1500 | GTP  | PB-O3B-PG-O3G  |
| 50  | 5B    | 3000 | IHP  | C1-O11-P1-O31  |
| 50  | 5B    | 3000 | IHP  | C5-O15-P5-O35  |
| 51  | 5C    | 1500 | GTP  | C5'-O5'-PA-O3A |

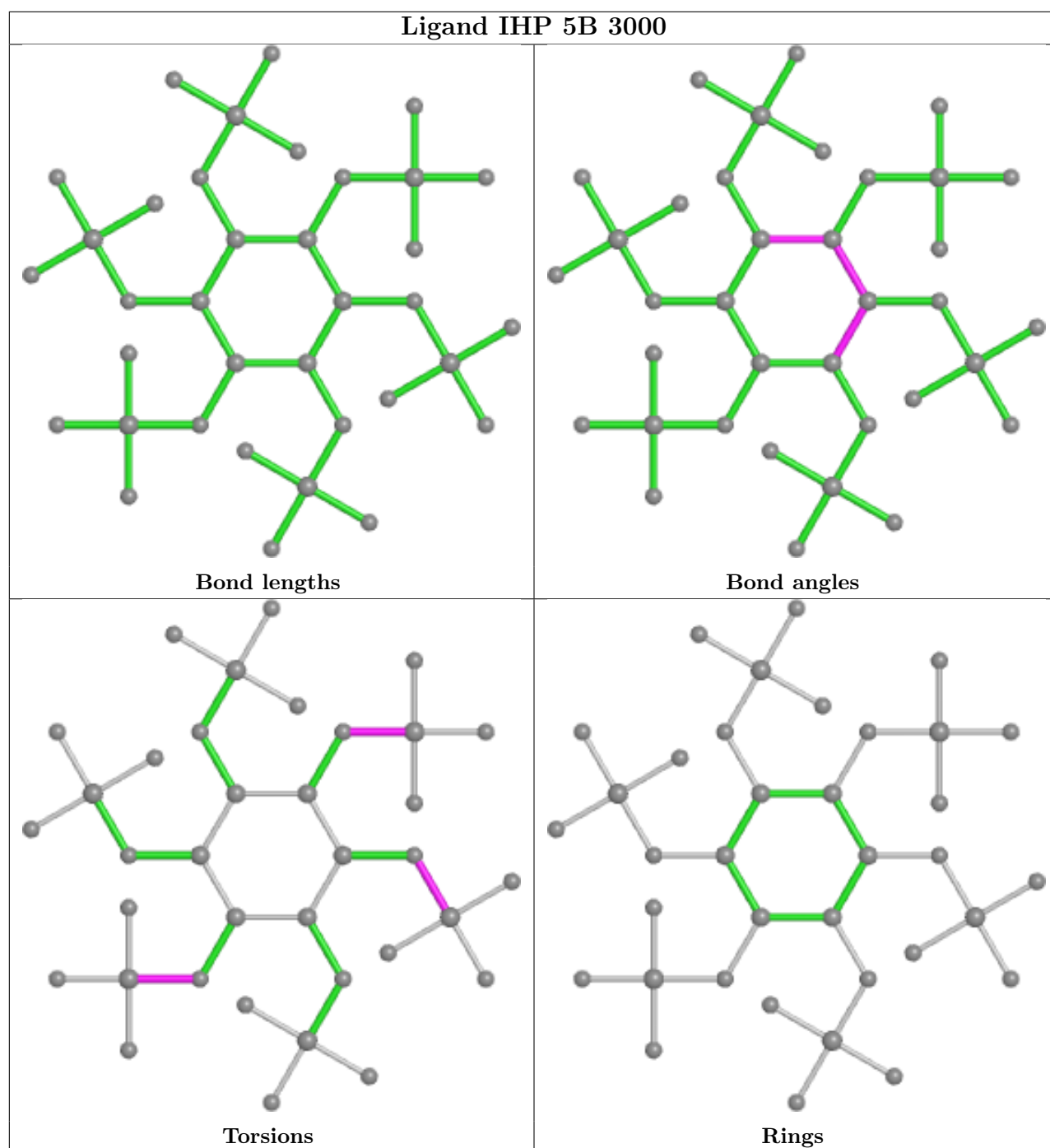
There are no ring outliers.

1 monomer is involved in 2 short contacts:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 51  | 5C    | 1500 | GTP  | 2       | 0            |

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





## 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.