



## Full wwPDB EM Validation Report ⓘ

Aug 6, 2026 – 02:52 pm BST

PDB ID : 9S7D / pdb\_00009s7d  
EMDB ID : EMD-54639  
Title : Structure of human mitochondrial COX1-translating ribosome nascent chain-OXA1L/MITRAC complex in open state (open COX1-mtRNC-OXA1L/MITRAC)  
Authors : Schoendorf, T.; Petrychenko, V.; Kotan, I.; Cruz-Zaragoza, L.D.; Dahal, D.; Wang, C.; Gal, T.; Dennerlein, S.; Kramer, G.; Fischer, N.; Rehling, P.  
Deposited on : 2025-08-04  
Resolution : 3.60 Å(reported)  
Based on initial model : 7QI5

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

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

A user guide is available at

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

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

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

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

EMDB validation analysis : 0.0.1.dev133  
Mogul : 1.8.4, CSD as541be (2020)  
MolProbity : 4-5-2 with Phenix2.0  
Buster-report : wwPDB partial adaption of 1.1.7 (2018)  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
EM percentile statistics : 202505.v01 (Using data in the EMDB archive up until May 2025)  
MapQ : 1.9.13  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)

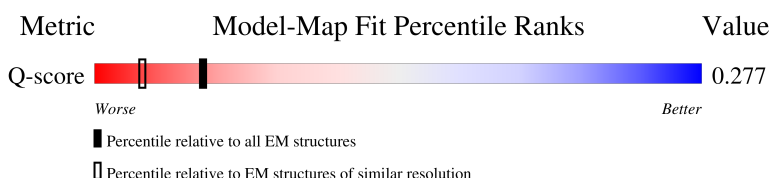
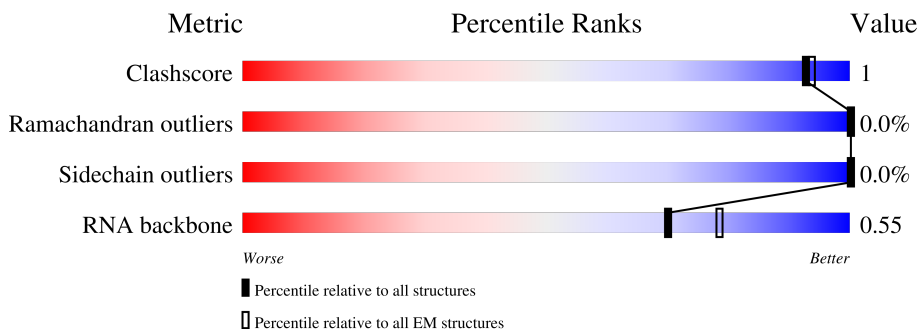
# 1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 3.60 Å.

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



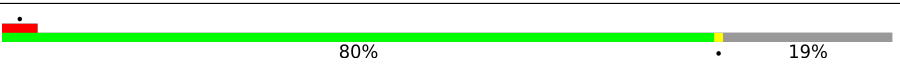
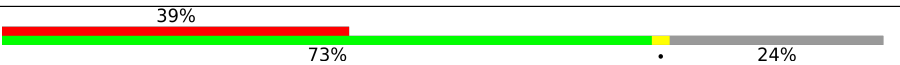
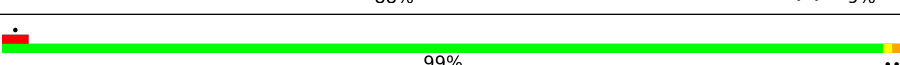
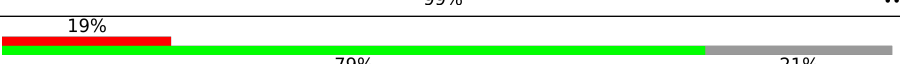
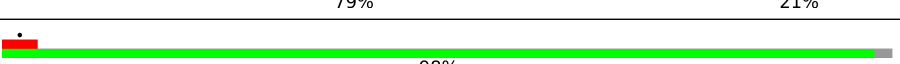
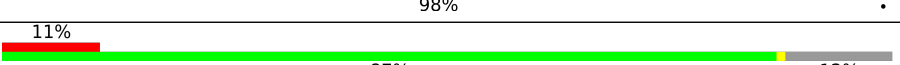
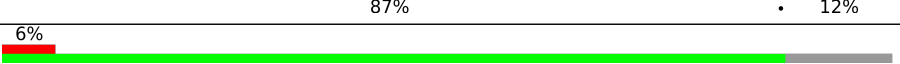
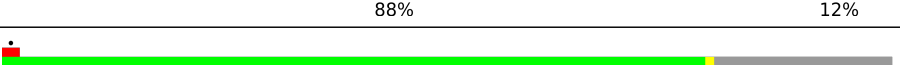
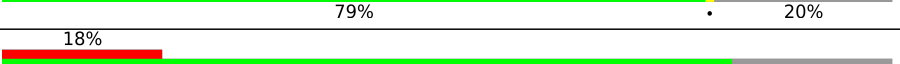
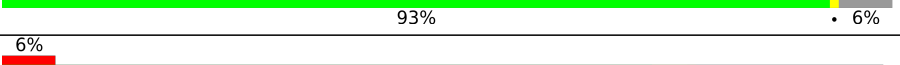
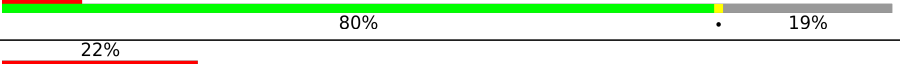
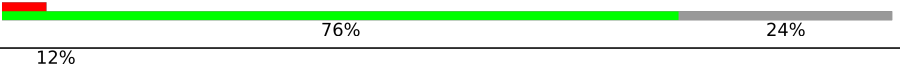
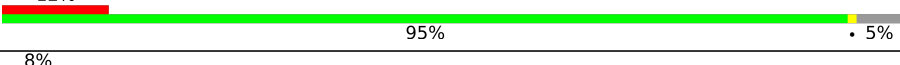
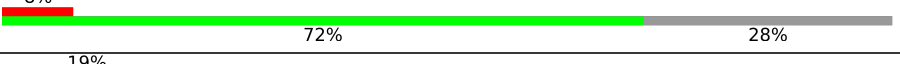
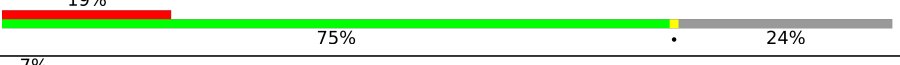
| Metric                | Whole archive<br>(#Entries) | EM structures<br>(#Entries) | Similar EM resolution<br>(#Entries, resolution range(Å)) |
|-----------------------|-----------------------------|-----------------------------|----------------------------------------------------------|
| Clashscore            | 229148                      | 23984                       | -                                                        |
| Ramachandran outliers | 224038                      | 23583                       | -                                                        |
| Sidechain outliers    | 223484                      | 23102                       | -                                                        |
| RNA backbone          | 8273                        | 3508                        | -                                                        |
| Q-score               | -                           | 25397                       | 12797 ( 3.10 - 4.10 )                                    |

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

| Mol | Chain | Length | Quality of chain                                         |
|-----|-------|--------|----------------------------------------------------------|
| 1   | A     | 1561   | <div> <div>7%</div> <div>83%</div> <div>16%</div> </div> |

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| Mol | Chain | Length | Quality of chain                                                                     |
|-----|-------|--------|--------------------------------------------------------------------------------------|
| 2   | B     | 72     |    |
| 3   | D     | 305    |    |
| 4   | E     | 348    |    |
| 5   | F     | 311    |    |
| 6   | H     | 267    |    |
| 7   | I     | 261    |    |
| 8   | J     | 192    |    |
| 9   | K     | 178    |    |
| 10  | L     | 145    |    |
| 11  | M     | 296    |    |
| 12  | N     | 251    |    |
| 13  | O     | 175    |    |
| 14  | P     | 180    |   |
| 15  | Q     | 292    |  |
| 16  | R     | 149    |  |
| 17  | S     | 205    |  |
| 18  | T     | 206    |  |
| 19  | U     | 153    |  |
| 20  | V     | 216    |  |
| 21  | W     | 148    |  |
| 22  | X     | 256    |  |
| 23  | Y     | 250    |  |
| 24  | Z     | 161    |  |
| 25  | AA    | 954    |  |
| 26  | AB    | 296    |  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 27  | AC    | 167    |                  |
| 28  | 0     | 188    |                  |
| 29  | 1     | 65     |                  |
| 30  | 2     | 92     |                  |
| 31  | 3     | 188    |                  |
| 32  | 4     | 103    |                  |
| 33  | z     | 325    |                  |
| 34  | t     | 198    |                  |
| 34  | u     | 198    |                  |
| 34  | v     | 198    |                  |
| 34  | w     | 198    |                  |
| 34  | x     | 198    |                  |
| 34  | y     | 198    |                  |
| 35  | 5     | 423    |                  |
| 36  | 6     | 380    |                  |
| 37  | 7     | 338    |                  |
| 38  | 8     | 206    |                  |
| 39  | 9     | 137    |                  |
| 40  | a     | 142    |                  |
| 41  | b     | 215    |                  |
| 42  | c     | 332    |                  |
| 43  | e     | 279    |                  |
| 44  | f     | 212    |                  |
| 45  | g     | 166    |                  |
| 46  | h     | 158    |                  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 47  | i     | 128    |                  |
| 48  | j     | 123    |                  |
| 49  | k     | 112    |                  |
| 50  | l     | 138    |                  |
| 51  | m     | 128    |                  |
| 52  | o     | 102    |                  |
| 53  | p     | 206    |                  |
| 54  | q     | 222    |                  |
| 55  | r     | 196    |                  |
| 56  | s     | 439    |                  |
| 57  | AD    | 430    |                  |
| 58  | AE    | 125    |                  |
| 59  | AF    | 242    |                  |
| 60  | AG    | 396    |                  |
| 61  | AH    | 201    |                  |
| 62  | AI    | 194    |                  |
| 63  | AJ    | 138    |                  |
| 64  | AK    | 128    |                  |
| 65  | AL    | 257    |                  |
| 66  | AM    | 137    |                  |
| 67  | AN    | 130    |                  |
| 68  | AO    | 258    |                  |
| 69  | AP    | 142    |                  |
| 70  | AQ    | 87     |                  |
| 71  | AR    | 360    |                  |

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| Mol | Chain | Length | Quality of chain |
|-----|-------|--------|------------------|
| 72  | AS    | 190    |                  |
| 73  | AT    | 173    |                  |
| 74  | AU    | 205    |                  |
| 75  | AV    | 414    |                  |
| 76  | AW    | 187    |                  |
| 77  | AX    | 398    |                  |
| 78  | AY    | 395    |                  |
| 79  | AZ    | 106    |                  |
| 80  | A0    | 217    |                  |
| 81  | A1    | 323    |                  |
| 82  | A2    | 118    |                  |
| 83  | A3    | 199    |                  |
| 84  | A4    | 689    |                  |
| 85  | Az    | 33     |                  |
| 86  | Aw    | 68     |                  |
| 87  | Ax    | 71     |                  |
| 88  | Av    | 38     |                  |
| 89  | d     | 306    |                  |
| 90  | Au    | 435    |                  |

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

| Mol | Type | Chain | Res | Chirality | Geometry | Clashes | Electron density |
|-----|------|-------|-----|-----------|----------|---------|------------------|
| 93  | VAL  | B     | 101 | -         | -        | X       | -                |

## 2 Entry composition

There are 98 unique types of molecules in this entry. The entry contains 180782 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 16S mitochondrial rRNA.

| Mol | Chain | Residues | Atoms |       |      |       |      | AltConf | Trace |
|-----|-------|----------|-------|-------|------|-------|------|---------|-------|
| 1   | A     | 1558     | Total | C     | N    | O     | P    | 0       | 0     |
|     |       |          | 33070 | 14843 | 5963 | 10706 | 1558 |         |       |

- Molecule 2 is a RNA chain called mitochondrial tRNAVal.

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 2   | B     | 72       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 1524  | 685 | 269 | 498 | 72 |         |       |

There are 2 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference      |
|-------|---------|----------|--------|----------|----------------|
| B     | 74      | C        | G      | conflict | GB NC_012920.1 |
| B     | 76      | A        | U      | conflict | GB NC_012920.1 |

- Molecule 3 is a protein called Large ribosomal subunit protein uL2m.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 3   | D     | 238      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1859  | 1157 | 376 | 317 | 9 |         |       |

- Molecule 4 is a protein called Large ribosomal subunit protein uL3m.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 4   | E     | 305      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2406  | 1545 | 418 | 432 | 11 |         |       |

- Molecule 5 is a protein called Large ribosomal subunit protein uL4m.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 5   | F     | 252      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2031  | 1305 | 370 | 350 | 6 |         |       |

- Molecule 6 is a protein called Large ribosomal subunit protein bL9m.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 6   | H     | 202      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1661  | 1067 | 304 | 286 | 4 |         |       |

- Molecule 7 is a protein called Large ribosomal subunit protein uL10m.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 7   | I     | 212      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1695  | 1088 | 304 | 292 | 11 |         |       |

- Molecule 8 is a protein called Large ribosomal subunit protein uL11m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 8   | J     | 175      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1330  | 847 | 237 | 244 | 2 |         |       |

- Molecule 9 is a protein called Large ribosomal subunit protein uL13m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 9   | K     | 178      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1455  | 936 | 259 | 253 | 7 |         |       |

There is a discrepancy between the modelled and reference sequences:

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

- Molecule 10 is a protein called Large ribosomal subunit protein uL14m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 10  | L     | 115      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 890   | 559 | 171 | 155 | 5 |         |       |

- Molecule 11 is a protein called Large ribosomal subunit protein uL15m.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 11  | M     | 291      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2327  | 1483 | 430 | 408 | 6 |         |       |

- Molecule 12 is a protein called Large ribosomal subunit protein uL16m.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 12  | N     | 222      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1786  | 1143 | 326 | 307 | 10 |         |       |

- Molecule 13 is a protein called Large ribosomal subunit protein bL17m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 13  | O     | 154      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1259  | 792 | 241 | 219 | 7 |         |       |

- Molecule 14 is a protein called Large ribosomal subunit protein uL18m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 14  | P     | 144      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1173  | 733 | 224 | 211 | 5 |         |       |

- Molecule 15 is a protein called Large ribosomal subunit protein bL19m.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 15  | Q     | 239      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1990  | 1277 | 353 | 351 | 9 |         |       |

- Molecule 16 is a protein called Large ribosomal subunit protein bL20m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 16  | R     | 140      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1154  | 732 | 231 | 187 | 4 |         |       |

- Molecule 17 is a protein called Large ribosomal subunit protein bL21m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 17  | S     | 161      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1293  | 835 | 227 | 227 | 4 |         |       |

- Molecule 18 is a protein called Large ribosomal subunit protein uL22m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 18  | T     | 166      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1369  | 875 | 254 | 233 | 7 |         |       |

- Molecule 19 is a protein called Large ribosomal subunit protein uL23m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 19  | U     | 153      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1251  | 788 | 234 | 226 | 3 |         |       |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment     | Reference  |
|-------|---------|----------|--------|-------------|------------|
| U     | 1       | ACE      | -      | acetylation | UNP Q16540 |

- Molecule 20 is a protein called Large ribosomal subunit protein uL24m.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 20  | V     | 216      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1754  | 1118 | 312 | 315 | 9 |         |       |

- Molecule 21 is a protein called Large ribosomal subunit protein bL27m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 21  | W     | 113      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 880   | 562 | 166 | 149 | 3 |         |       |

- Molecule 22 is a protein called Large ribosomal subunit protein bL28m.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 22  | X     | 244      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2044  | 1322 | 352 | 365 | 5 |         |       |

- Molecule 23 is a protein called Large ribosomal subunit protein uL29m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 23  | Y     | 181      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1556  | 995 | 298 | 259 | 4 |         |       |

- Molecule 24 is a protein called Large ribosomal subunit protein uL30m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 24  | Z     | 122      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 996   | 636 | 186 | 171 | 3 |         |       |

- Molecule 25 is a RNA chain called 12S mitochondrial rRNA.

| Mol | Chain | Residues | Atoms |      |      |      |     | AltConf | Trace |
|-----|-------|----------|-------|------|------|------|-----|---------|-------|
| 25  | AA    | 954      | Total | C    | N    | O    | P   | 0       | 0     |
|     |       |          | 20260 | 9088 | 3647 | 6571 | 954 |         |       |

- Molecule 26 is a protein called Small ribosomal subunit protein uS2m.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 26  | AB    | 225      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1828  | 1164 | 331 | 323 | 10 |         |       |

- Molecule 27 is a protein called Small ribosomal subunit protein uS3m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 27  | AC    | 132      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1083  | 699 | 195 | 185 | 4 |         |       |

- Molecule 28 is a protein called Large ribosomal subunit protein bL32m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 28  | 0     | 110      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 898   | 554 | 176 | 162 | 6 |         |       |

- Molecule 29 is a protein called Large ribosomal subunit protein bL33m.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 29  | 1     | 56       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 464   | 296 | 89 | 77 | 2 |         |       |

- Molecule 30 is a protein called Large ribosomal subunit protein bL34m.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 30  | 2     | 46       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 377   | 233 | 83 | 60 | 1 |         |       |

- Molecule 31 is a protein called Large ribosomal subunit protein bL35m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 31  | 3     | 95       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 832   | 539 | 162 | 128 | 3 |         |       |

- Molecule 32 is a protein called Large ribosomal subunit protein bL36m.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 32  | 4     | 38       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 342   | 217 | 72 | 49 | 4 |         |       |

- Molecule 33 is a protein called Large ribosomal subunit protein uL1m.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 33  | z     | 252      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2027  | 1304 | 336 | 381 | 6 |         |       |

- Molecule 34 is a protein called Large ribosomal subunit protein bL12m.

| Mol | Chain | Residues | Atoms |     |    |    |  | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|--|---------|-------|
| 34  | w     | 31       | Total | C   | N  | O  |  | 0       | 0     |
|     |       |          | 245   | 159 | 39 | 47 |  |         |       |
| 34  | x     | 31       | Total | C   | N  | O  |  | 0       | 0     |
|     |       |          | 245   | 159 | 39 | 47 |  |         |       |
| 34  | t     | 46       | Total | C   | N  | O  |  | 0       | 0     |
|     |       |          | 354   | 228 | 56 | 70 |  |         |       |
| 34  | u     | 32       | Total | C   | N  | O  |  | 0       | 0     |
|     |       |          | 257   | 168 | 40 | 49 |  |         |       |
| 34  | v     | 32       | Total | C   | N  | O  |  | 0       | 0     |
|     |       |          | 257   | 168 | 40 | 49 |  |         |       |
| 34  | y     | 31       | Total | C   | N  | O  |  | 0       | 0     |
|     |       |          | 245   | 159 | 39 | 47 |  |         |       |

- Molecule 35 is a protein called Large ribosomal subunit protein mL37.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 35  | 5     | 393      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3200  | 2067 | 557 | 565 | 11 |         |       |

- Molecule 36 is a protein called Large ribosomal subunit protein mL38.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 36  | 6     | 354      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2948  | 1881 | 525 | 533 | 9 |         |       |

- Molecule 37 is a protein called Large ribosomal subunit protein mL39.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 37  | 7     | 294      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2390  | 1529 | 405 | 438 | 18 |         |       |

- Molecule 38 is a protein called Large ribosomal subunit protein mL40.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 38  | 8     | 144      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1219  | 775 | 214 | 228 | 2 |         |       |

- Molecule 39 is a protein called Large ribosomal subunit protein mL41.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 39  | 9     | 124      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 997   | 644 | 170 | 181 | 2 |         |       |

- Molecule 40 is a protein called Large ribosomal subunit protein mL42.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 40  | a     | 100      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 840   | 529 | 152 | 154 | 5 |         |       |

- Molecule 41 is a protein called Large ribosomal subunit protein mL43.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 41  | b     | 151      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1196  | 744 | 231 | 218 | 3 |         |       |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment     | Reference  |
|-------|---------|----------|--------|-------------|------------|
| b     | 2       | ACE      | -      | acetylation | UNP Q8N983 |

- Molecule 42 is a protein called Large ribosomal subunit protein mL44.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 42  | c     | 286      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2299  | 1470 | 397 | 423 | 9 |         |       |

- Molecule 43 is a protein called Large ribosomal subunit protein mL46.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 43  | e     | 230      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1866  | 1185 | 329 | 346 | 6 |         |       |

- Molecule 44 is a protein called Large ribosomal subunit protein mL48.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 44  | f     | 157      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1252  | 799 | 207 | 242 | 4 |         |       |

- Molecule 45 is a protein called Large ribosomal subunit protein mL49.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 45  | g     | 134      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1113  | 719 | 193 | 199 | 2 |         |       |

- Molecule 46 is a protein called Large ribosomal subunit protein mL50.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 46  | h     | 110      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 895   | 568 | 156 | 168 | 3 |         |       |

- Molecule 47 is a protein called Large ribosomal subunit protein mL51.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 47  | i     | 97       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 828   | 532 | 165 | 127 | 4 |         |       |

- Molecule 48 is a protein called Large ribosomal subunit protein mL52.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 48  | j     | 94       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 745   | 463 | 144 | 136 | 2 |         |       |

- Molecule 49 is a protein called Large ribosomal subunit protein mL53.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 49  | k     | 102      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 774   | 479 | 148 | 142 | 5 |         |       |

There is a discrepancy between the modelled and reference sequences:

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

- Molecule 50 is a protein called Large ribosomal subunit protein mL54.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 50  | l     | 82       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 688   | 437 | 120 | 128 | 3 |         |       |

- Molecule 51 is a protein called Large ribosomal subunit protein mL55.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 51  | m     | 92       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 791   | 488 | 159 | 142 | 2 |         |       |

- Molecule 52 is a protein called Large ribosomal subunit protein mL63.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 52  | o     | 94       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 798   | 501 | 165 | 129 | 3 |         |       |

- Molecule 53 is a protein called Large ribosomal subunit protein mL62.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 53  | p     | 147      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1205  | 748 | 228 | 225 | 4 |         |       |

- Molecule 54 is a protein called Large ribosomal subunit protein mL64.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 54  | q     | 166      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1398  | 870 | 272 | 251 | 5 |         |       |

- Molecule 55 is a protein called Large ribosomal subunit protein mL66.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 55  | r     | 162      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1322  | 839 | 252 | 223 | 8 |         |       |

- Molecule 56 is a protein called Large ribosomal subunit protein mL65.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 56  | s     | 386      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 3155  | 2023 | 559 | 559 | 14 |         |       |

- Molecule 57 is a protein called Small ribosomal subunit protein uS5m.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 57  | AD    | 339      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2700  | 1695 | 510 | 482 | 13 |         |       |

- Molecule 58 is a protein called Small ribosomal subunit protein bS6m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 58  | AE    | 122      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 972   | 614 | 177 | 177 | 4 |         |       |

- Molecule 59 is a protein called Small ribosomal subunit protein uS7m.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 59  | AF    | 208      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1725  | 1104 | 312 | 298 | 11 |         |       |

- Molecule 60 is a protein called Small ribosomal subunit protein uS9m.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 60  | AG    | 328      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2695  | 1714 | 478 | 489 | 14 |         |       |

- Molecule 61 is a protein called Small ribosomal subunit protein uS10m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 61  | AH    | 140      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1152  | 745 | 194 | 210 | 3 |         |       |

- Molecule 62 is a protein called Small ribosomal subunit protein uS11m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 62  | AI    | 137      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1020  | 642 | 192 | 182 | 4 |         |       |

There is a discrepancy between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference  |
|-------|---------|----------|--------|----------|------------|
| AI    | 184     | 5F0      | ASN    | conflict | UNP P82912 |

- Molecule 63 is a protein called Small ribosomal subunit protein uS12m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 63  | AJ    | 108      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 839   | 521 | 169 | 143 | 6 |         |       |

- Molecule 64 is a protein called Small ribosomal subunit protein uS14m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 64  | AK    | 101      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 862   | 537 | 179 | 141 | 5 |         |       |

- Molecule 65 is a protein called Small ribosomal subunit protein uS15m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 65  | AL    | 174      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1453  | 925 | 270 | 251 | 7 |         |       |

- Molecule 66 is a protein called Small ribosomal subunit protein bS16m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 66  | AM    | 119      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 942   | 594 | 185 | 157 | 6 |         |       |

- Molecule 67 is a protein called Small ribosomal subunit protein uS17m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 67  | AN    | 110      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 868   | 562 | 156 | 147 | 3 |         |       |

- Molecule 68 is a protein called Small ribosomal subunit protein mS40.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 68  | AO    | 193      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1592  | 1014 | 294 | 277 | 7 |         |       |

- Molecule 69 is a protein called Small ribosomal subunit protein bS18m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 69  | AP    | 97       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 781   | 501 | 134 | 138 | 8 |         |       |

- Molecule 70 is a protein called Small ribosomal subunit protein bS21m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 70  | AQ    | 87       | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 744   | 460 | 150 | 126 | 8 |         |       |

There are 2 discrepancies between the modelled and reference sequences:

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

- Molecule 71 is a protein called Small ribosomal subunit protein mS22.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 71  | AR    | 295      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 2409  | 1533 | 413 | 455 | 8 |         |       |

- Molecule 72 is a protein called Small ribosomal subunit protein mS23.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 72  | AS    | 135      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1111  | 716 | 198 | 196 | 1 |         |       |

- Molecule 73 is a protein called Small ribosomal subunit protein mS25.

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 73  | AT    | 168      | Total | C   | N   | O   | S  | 0       | 0     |
|     |       |          | 1371  | 877 | 239 | 244 | 11 |         |       |

- Molecule 74 is a protein called Small ribosomal subunit protein mS26.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 74  | AU    | 176      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1488  | 916 | 301 | 267 | 4 |         |       |

- Molecule 75 is a protein called Small ribosomal subunit protein mS27.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 75  | AV    | 362      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2969  | 1904 | 495 | 558 | 12 |         |       |

- Molecule 76 is a protein called Small ribosomal subunit protein bS1m.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 76  | AW    | 100      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 789   | 498 | 141 | 146 | 4 |         |       |

- Molecule 77 is a protein called Small ribosomal subunit protein mS29.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 77  | AX    | 352      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2849  | 1822 | 499 | 517 | 11 |         |       |

- Molecule 78 is a protein called Small ribosomal subunit protein mS31.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 78  | AY    | 149      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 1246  | 801 | 207 | 234 | 4 |         |       |

- Molecule 79 is a protein called Small ribosomal subunit protein mS33.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 79  | AZ    | 100      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 839   | 534 | 153 | 148 | 4 |         |       |

- Molecule 80 is a protein called Small ribosomal subunit protein mS34.

| Mol | Chain | Residues | Atoms |      |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|---|---------|-------|
| 80  | A0    | 215      | Total | C    | N   | O   | S | 0       | 0     |
|     |       |          | 1787  | 1130 | 339 | 313 | 5 |         |       |

- Molecule 81 is a protein called Small ribosomal subunit protein mS35.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 81  | A1    | 279      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 2265  | 1435 | 387 | 432 | 11 |         |       |

- Molecule 82 is a protein called Small ribosomal subunit protein mS37.

| Mol | Chain | Residues | Atoms |     |     |     |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|---|---------|-------|
| 82  | A2    | 118      | Total | C   | N   | O   | S | 0       | 0     |
|     |       |          | 935   | 579 | 182 | 166 | 8 |         |       |

There is a discrepancy between the modelled and reference sequences:

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

- Molecule 83 is a protein called Small ribosomal subunit protein bS22, mitochondrial.

| Mol | Chain | Residues | Atoms |     |     |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|----|---|---------|-------|
| 83  | A3    | 70       | Total | C   | N   | O  | S | 0       | 0     |
|     |       |          | 625   | 401 | 134 | 89 | 1 |         |       |

- Molecule 84 is a protein called Small ribosomal subunit protein mS39.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 84  | A4    | 588      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 4768  | 3053 | 808 | 879 | 28 |         |       |

- Molecule 85 is a RNA chain called mRNA (Visualization example).

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 85  | Az    | 33       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 701   | 316 | 124 | 228 | 33 |         |       |

- Molecule 86 is a RNA chain called A-site tRNA (Visualisation example).

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 86  | Aw    | 68       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 1435  | 646 | 249 | 472 | 68 |         |       |

There are 3 discrepancies between the modelled and reference sequences:

| Chain | Residue | Modelled | Actual | Comment  | Reference     |
|-------|---------|----------|--------|----------|---------------|
| Aw    | 35      | A        | C      | conflict | GB 1896813690 |
| Aw    | 36      | C        | G      | conflict | GB 1896813690 |
| Aw    | 44      | C        | A      | conflict | GB 1896813690 |

- Molecule 87 is a RNA chain called P-site tRNA (Visualisation example).

| Mol | Chain | Residues | Atoms |     |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|-----|-----|-----|----|---------|-------|
| 87  | Ax    | 71       | Total | C   | N   | O   | P  | 0       | 0     |
|     |       |          | 1499  | 672 | 260 | 496 | 71 |         |       |

- Molecule 88 is a protein called COX1 nascent chain.

| Mol | Chain | Residues | Atoms |     |    |    | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---------|-------|
| 88  | Av    | 38       | Total | C   | N  | O  | 0       | 0     |
|     |       |          | 190   | 114 | 38 | 38 |         |       |

- Molecule 89 is a protein called Large ribosomal subunit protein mL45.

| Mol | Chain | Residues | Atoms |      |     |     |    | AltConf | Trace |
|-----|-------|----------|-------|------|-----|-----|----|---------|-------|
| 89  | d     | 241      | Total | C    | N   | O   | S  | 0       | 0     |
|     |       |          | 1969  | 1250 | 343 | 362 | 14 |         |       |

- Molecule 90 is a protein called Mitochondrial inner membrane protein OXA1L.

| Mol | Chain | Residues | Atoms |     |    |    |   | AltConf | Trace |
|-----|-------|----------|-------|-----|----|----|---|---------|-------|
| 90  | Au    | 51       | Total | C   | N  | O  | S | 0       | 0     |
|     |       |          | 431   | 265 | 87 | 77 | 2 |         |       |

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

| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 91  | A     | 28       | Total | K  | 0       |
|     |       |          | 28    | 28 |         |
| 91  | D     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | M     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | N     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | AA    | 20       | Total | K  | 0       |
|     |       |          | 20    | 20 |         |
| 91  | 3     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | 6     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |
| 91  | o     | 1        | Total | K  | 0       |
|     |       |          | 1     | 1  |         |

- Molecule 92 is MAGNESIUM ION (CCD ID: MG) (formula: Mg).

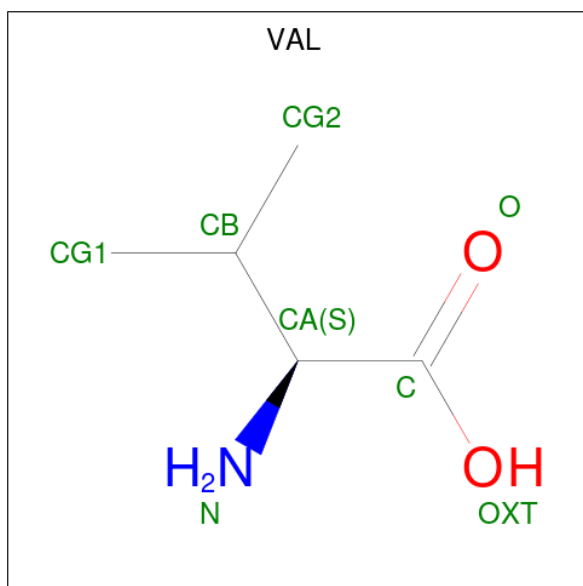
| Mol | Chain | Residues | Atoms |     | AltConf |
|-----|-------|----------|-------|-----|---------|
| 92  | A     | 135      | Total | Mg  | 0       |
|     |       |          | 135   | 135 |         |
| 92  | D     | 2        | Total | Mg  | 0       |
|     |       |          | 2     | 2   |         |

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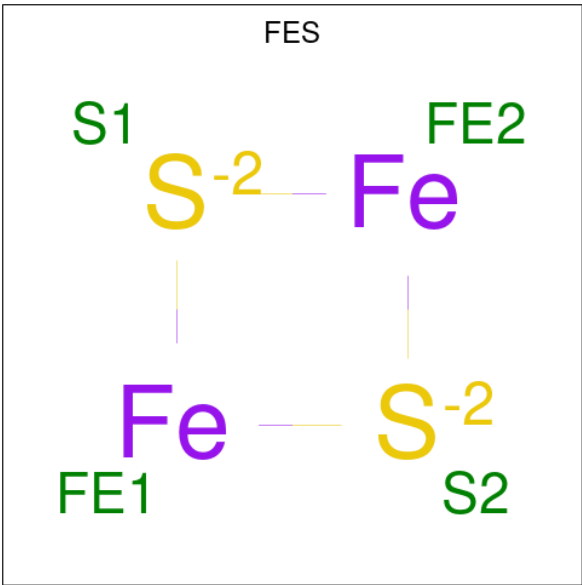
| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 92  | E     | 1        | Total | Mg | 0       |
|     |       |          | 1     | 1  |         |
| 92  | O     | 1        | Total | Mg | 0       |
|     |       |          | 1     | 1  |         |
| 92  | AA    | 53       | Total | Mg | 0       |
|     |       |          | 53    | 53 |         |
| 92  | AB    | 1        | Total | Mg | 0       |
|     |       |          | 1     | 1  |         |
| 92  | g     | 1        | Total | Mg | 0       |
|     |       |          | 1     | 1  |         |
| 92  | AX    | 1        | Total | Mg | 0       |
|     |       |          | 1     | 1  |         |
| 92  | A3    | 1        | Total | Mg | 0       |
|     |       |          | 1     | 1  |         |

- Molecule 93 is VALINE (CCD ID: VAL) (formula:  $C_5H_{11}NO_2$ ).



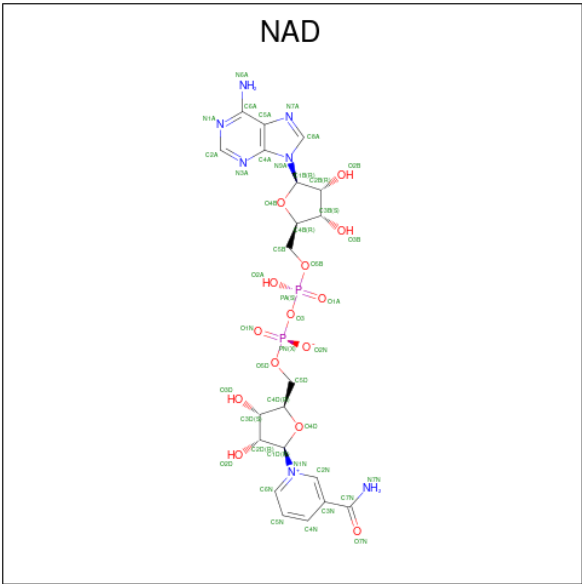
| Mol | Chain | Residues | Atoms |   |   |   | AltConf |
|-----|-------|----------|-------|---|---|---|---------|
| 93  | B     | 1        | Total | C | N | O | 0       |
|     |       |          | 7     | 5 | 1 | 1 |         |

- Molecule 94 is FE2/S2 (INORGANIC) CLUSTER (CCD ID: FES) (formula:  $Fe_2S_2$ ).



| Mol | Chain | Residues | Atoms |    |   | AltConf |
|-----|-------|----------|-------|----|---|---------|
| 94  | I     | 1        | Total | Fe | S | 0       |
|     |       |          | 4     | 2  | 2 |         |
| 94  | AE    | 1        | Total | Fe | S | 0       |
|     |       |          | 4     | 2  | 2 |         |
| 94  | AT    | 1        | Total | Fe | S | 0       |
|     |       |          | 4     | 2  | 2 |         |

- Molecule 95 is NICOTINAMIDE-ADENINE-DINUCLEOTIDE (CCD ID: NAD) (formula: C<sub>21</sub>H<sub>27</sub>N<sub>7</sub>O<sub>14</sub>P<sub>2</sub>).

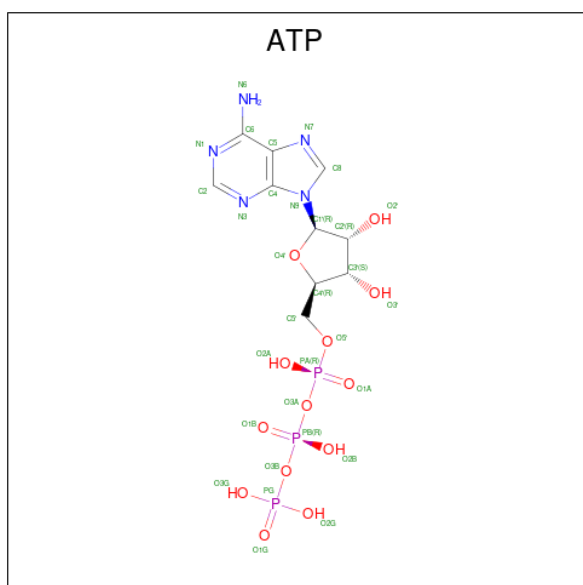


| Mol | Chain | Residues | Atoms |    |   |    |   | AltConf |
|-----|-------|----------|-------|----|---|----|---|---------|
| 95  | AA    | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 44    | 21 | 7 | 14 | 2 |         |

- Molecule 96 is ZINC ION (CCD ID: ZN) (formula: Zn).

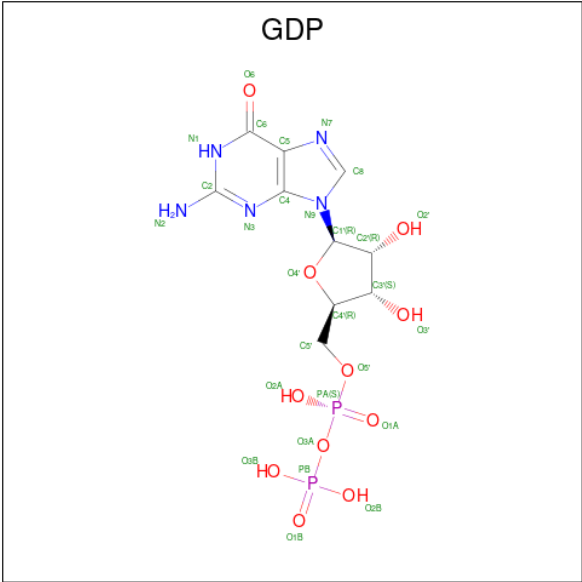
| Mol | Chain | Residues | Atoms |    | AltConf |
|-----|-------|----------|-------|----|---------|
| 96  | 0     | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |
| 96  | 4     | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |
| 96  | AO    | 1        | Total | Zn | 0       |
|     |       |          | 1     | 1  |         |

- Molecule 97 is ADENOSINE-5'-TRIPHOSPHATE (CCD ID: ATP) (formula: C<sub>10</sub>H<sub>16</sub>N<sub>5</sub>O<sub>13</sub>P<sub>3</sub>).



| Mol | Chain | Residues | Atoms |    |   |    |   | AltConf |
|-----|-------|----------|-------|----|---|----|---|---------|
| 97  | AX    | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 31    | 10 | 5 | 13 | 3 |         |

- Molecule 98 is GUANOSINE-5'-DIPHOSPHATE (CCD ID: GDP) (formula: C<sub>10</sub>H<sub>15</sub>N<sub>5</sub>O<sub>11</sub>P<sub>2</sub>).

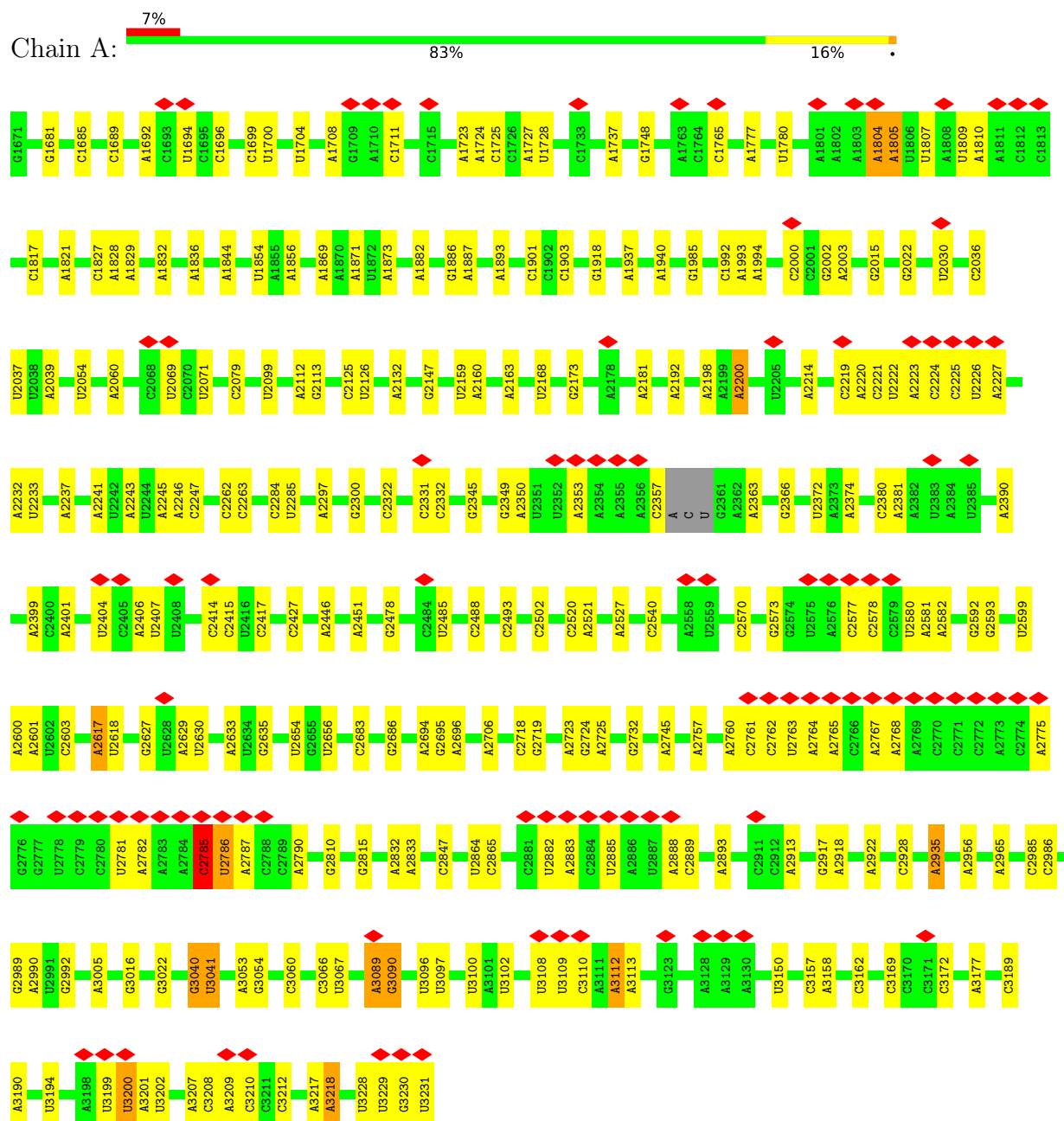


| Mol | Chain | Residues | Atoms |    |   |    |   | AltConf |
|-----|-------|----------|-------|----|---|----|---|---------|
| 98  | AX    | 1        | Total | C  | N | O  | P | 0       |
|     |       |          | 28    | 10 | 5 | 11 | 2 |         |

### 3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and atom inclusion in map density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red diamond above a residue indicates a poor fit to the EM map for this residue (all-atom inclusion < 40%). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

#### • Molecule 1: 16S mitochondrial rRNA



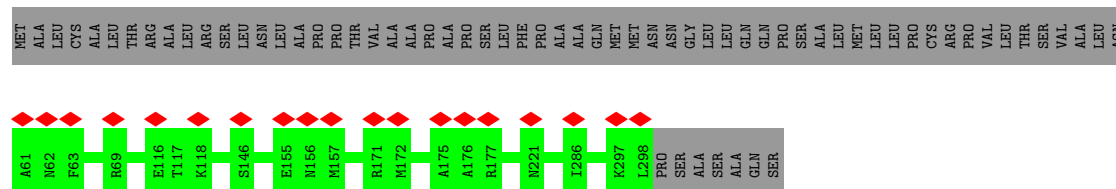
- Molecule 2: mitochondrial tRNAVal

Chain B: 



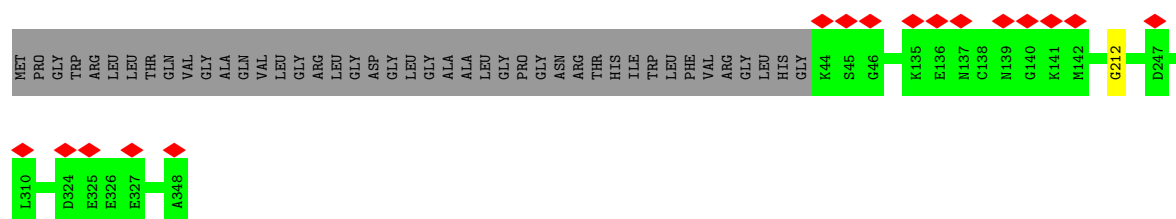
- Molecule 3: Large ribosomal subunit protein uL2m

Chain D: 



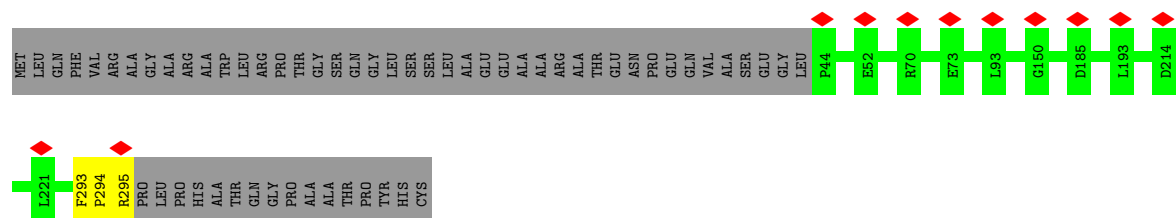
- Molecule 4: Large ribosomal subunit protein uL3m

Chain E: 



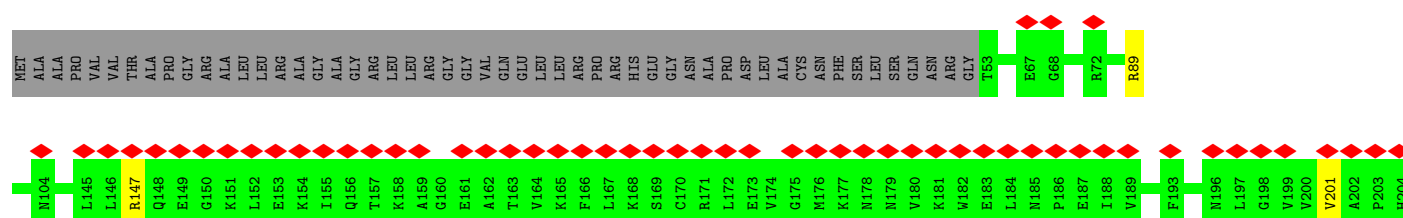
- Molecule 5: Large ribosomal subunit protein uL4m

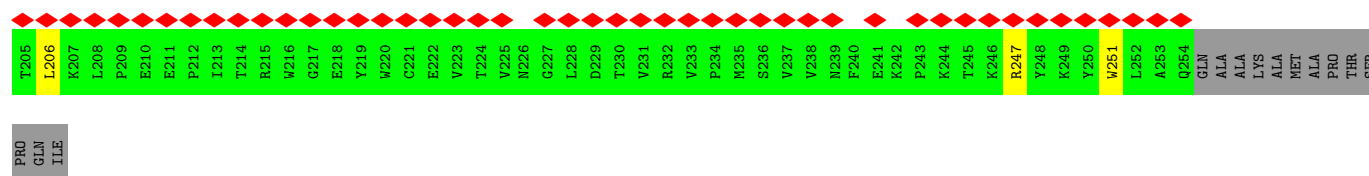
Chain F: 



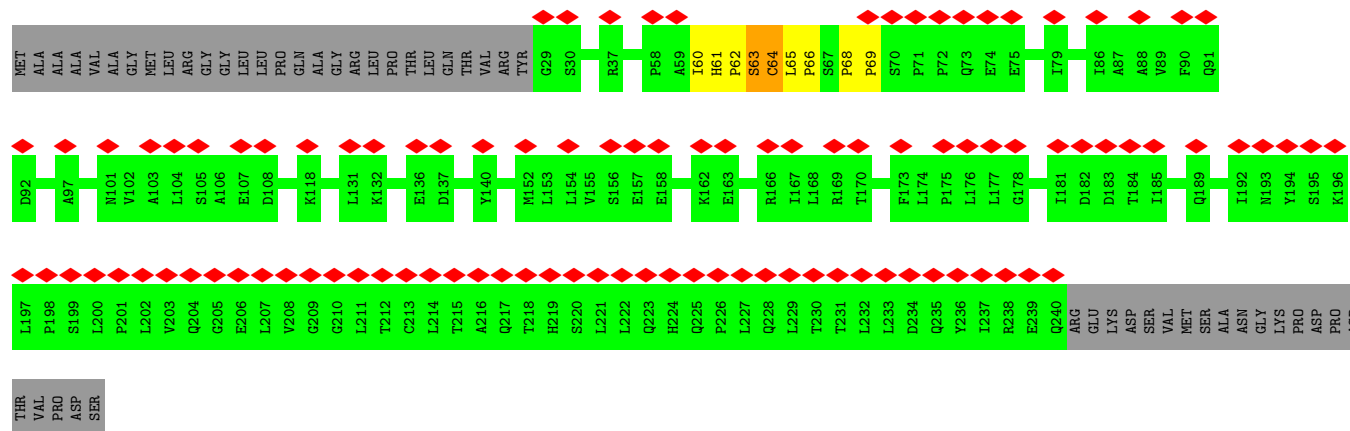
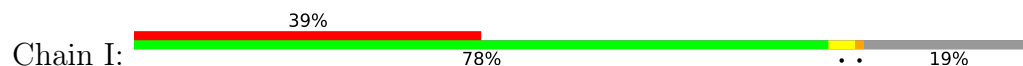
- Molecule 6: Large ribosomal subunit protein bL9m

Chain H: 

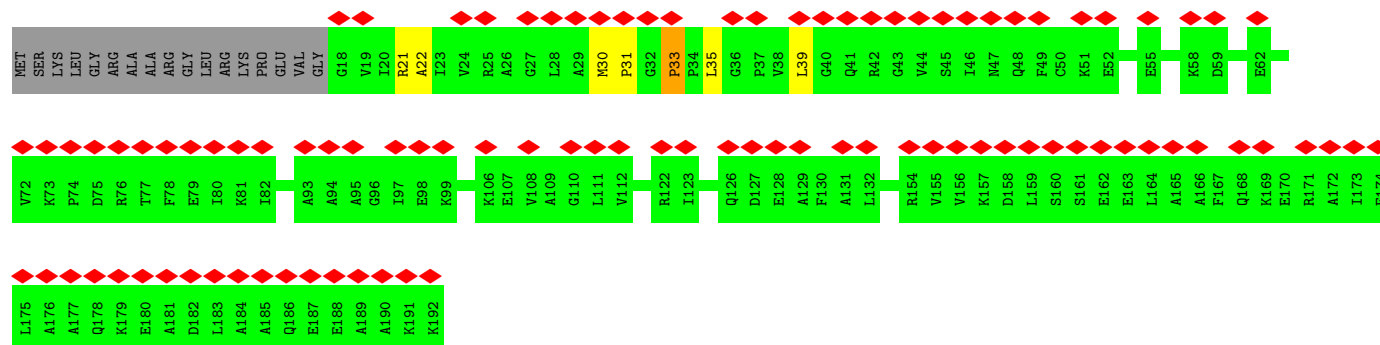
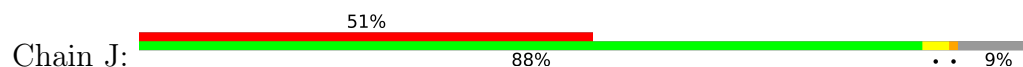




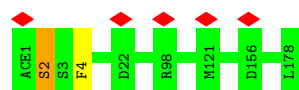
- Molecule 7: Large ribosomal subunit protein uL10m



- Molecule 8: Large ribosomal subunit protein uL11m

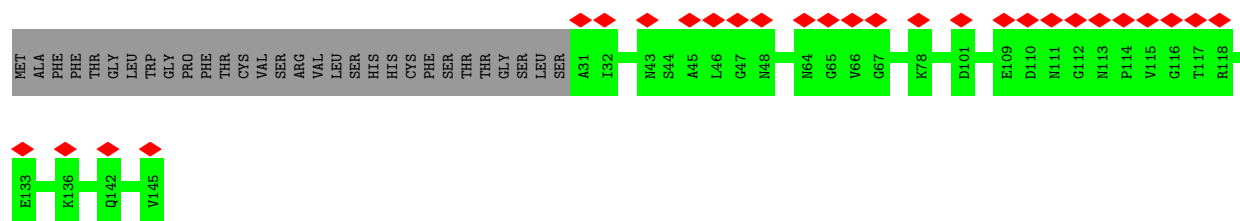


- Molecule 9: Large ribosomal subunit protein uL13m



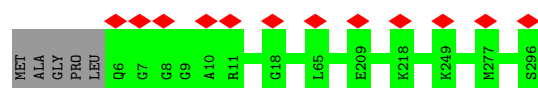
- Molecule 10: Large ribosomal subunit protein uL14m





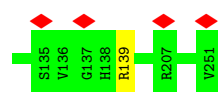
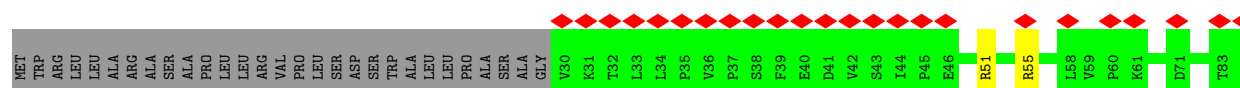
- Molecule 11: Large ribosomal subunit protein uL15m

Chain M: 98%



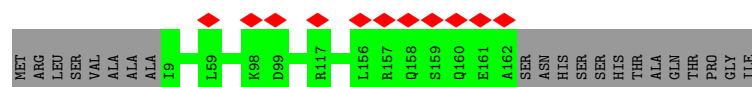
- Molecule 12: Large ribosomal subunit protein uL16m

Chain N: 11% 87% 12%



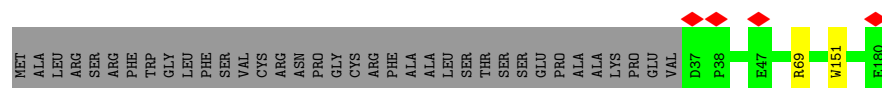
- Molecule 13: Large ribosomal subunit protein bL17m

Chain O: 6% 88% 12%



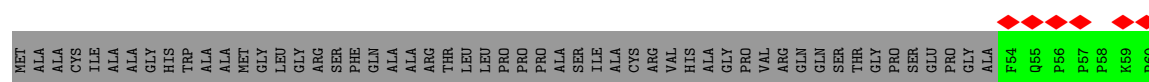
- Molecule 14: Large ribosomal subunit protein uL18m

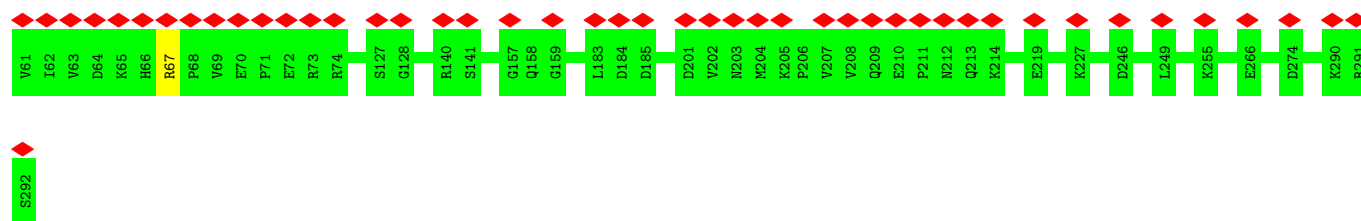
Chain P: 79% 20%



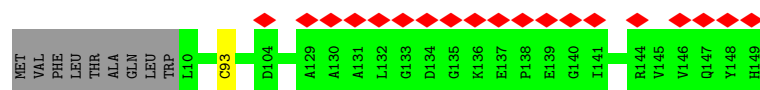
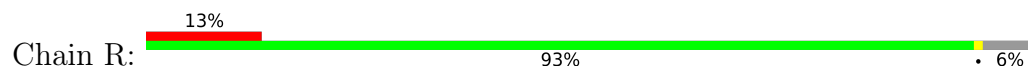
- Molecule 15: Large ribosomal subunit protein bL19m

Chain Q: 18% 82% 18%

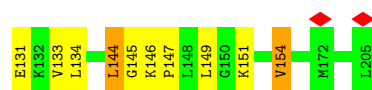
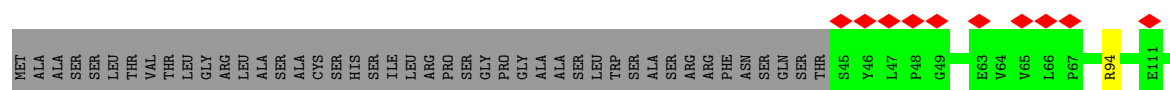
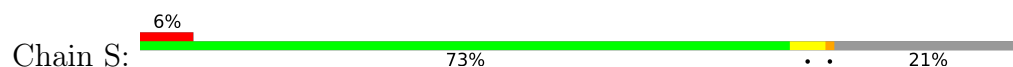




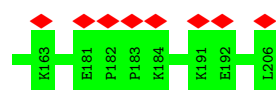
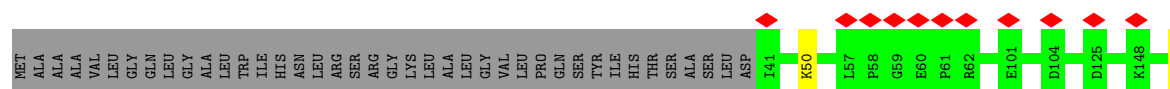
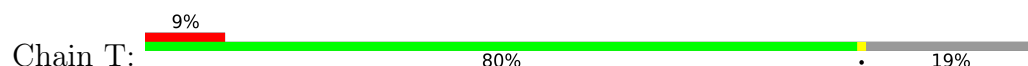
- Molecule 16: Large ribosomal subunit protein bL20m



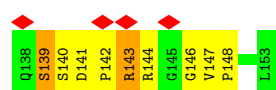
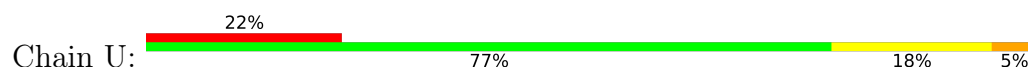
- Molecule 17: Large ribosomal subunit protein bL21m



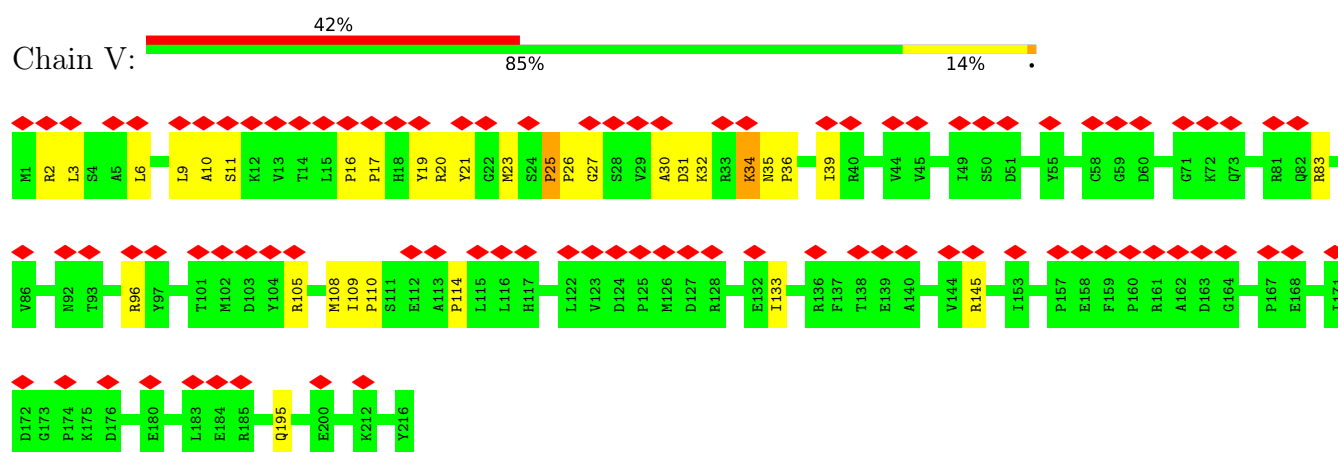
- Molecule 18: Large ribosomal subunit protein uL22m



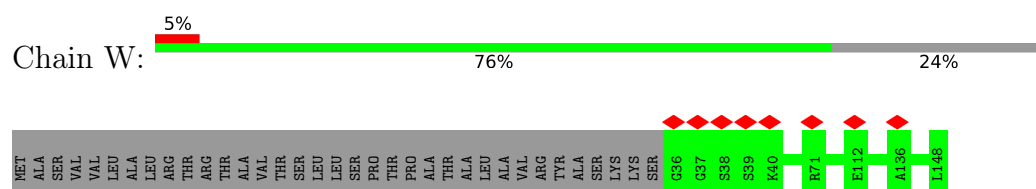
- Molecule 19: Large ribosomal subunit protein uL23m



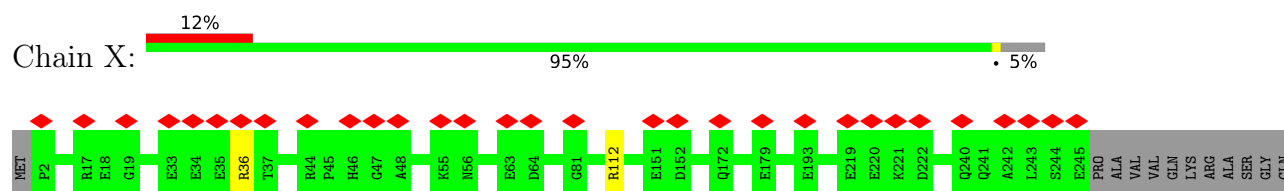
- Molecule 20: Large ribosomal subunit protein uL24m



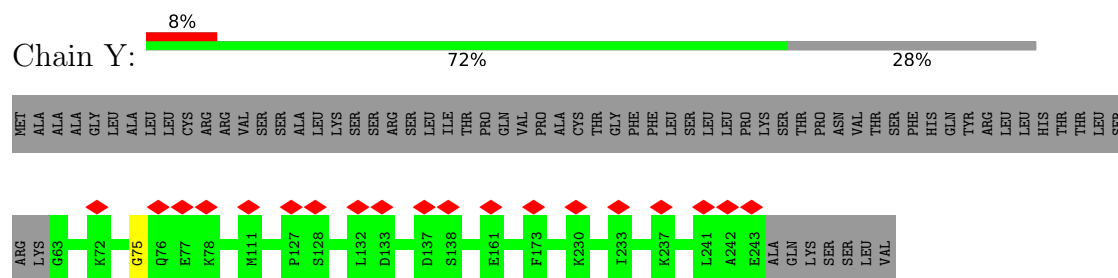
- Molecule 21: Large ribosomal subunit protein bL27m



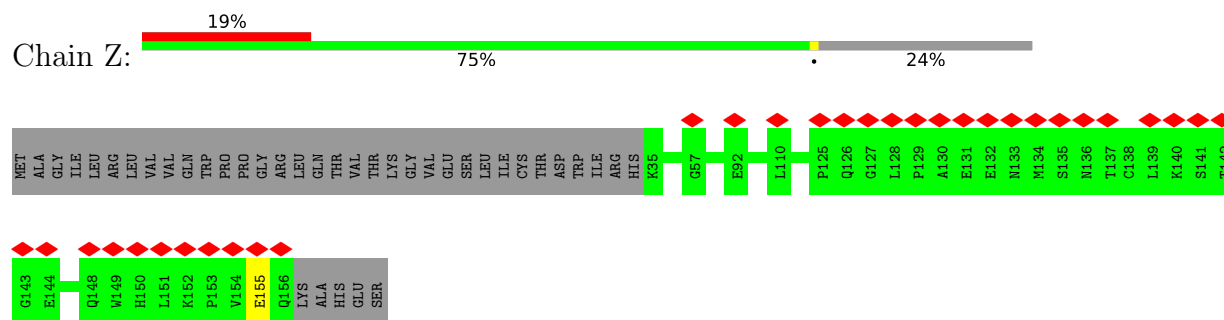
- Molecule 22: Large ribosomal subunit protein bL28m



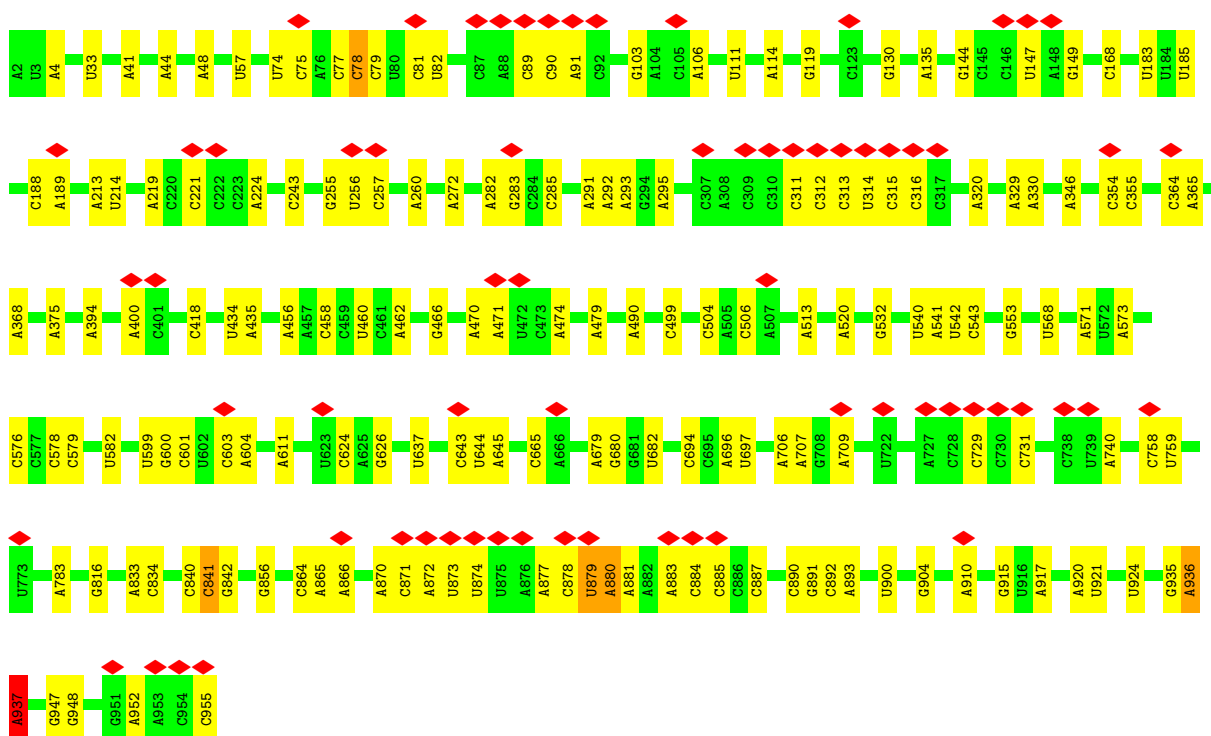
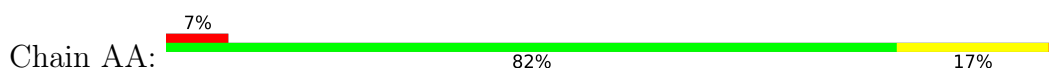
- Molecule 23: Large ribosomal subunit protein uL29m



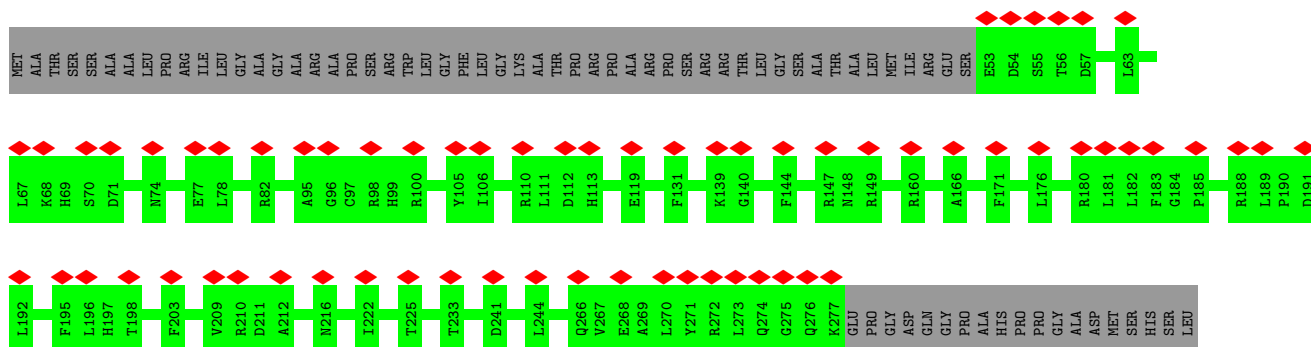
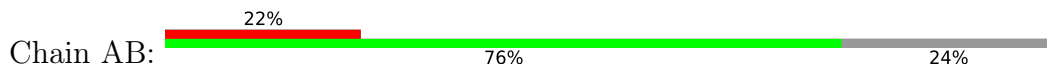
- Molecule 24: Large ribosomal subunit protein uL30m



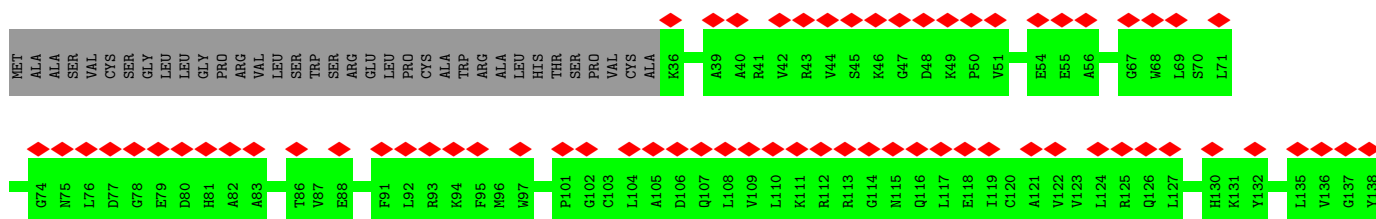
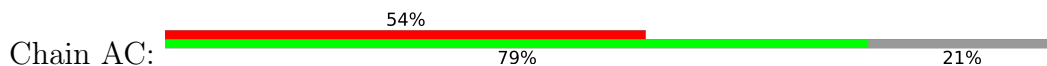
- Molecule 25: 12S mitochondrial rRNA

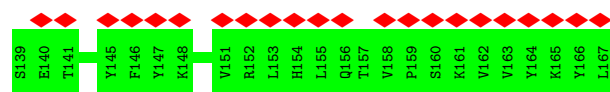


- Molecule 26: Small ribosomal subunit protein uS2m

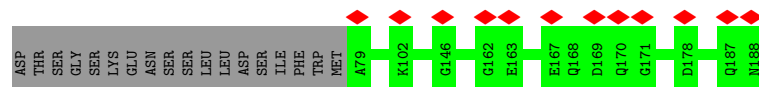
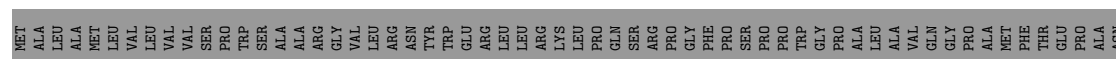


- Molecule 27: Small ribosomal subunit protein uS3m

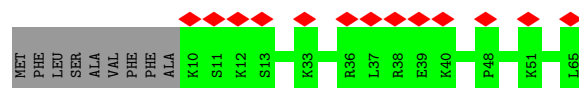
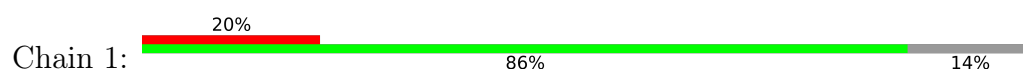




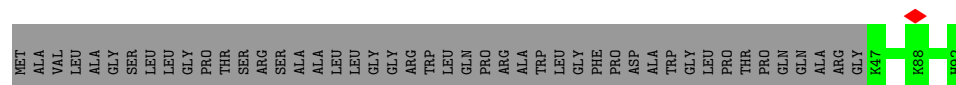
- Molecule 28: Large ribosomal subunit protein bL32m



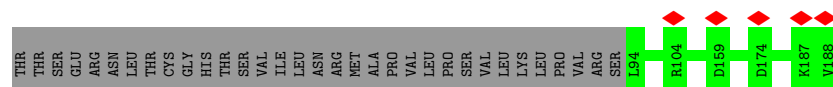
- Molecule 29: Large ribosomal subunit protein bL33m



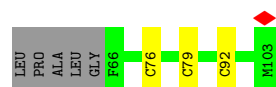
- Molecule 30: Large ribosomal subunit protein bL34m



- Molecule 31: Large ribosomal subunit protein bL35m



- Molecule 32: Large ribosomal subunit protein bL36m



- Molecule 33: Large ribosomal subunit protein uL1m

Chain z:

- Molecule 34: Large ribosomal subunit protein bL12m

Chain w:

- Molecule 34: Large ribosomal subunit protein bL12m

Chain x:





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

P61 P62 K63 I64 Q65 Q66 L67 V68 Q69 D70 I71 A72 S73 L74 T75 L76 L77 E78 I79 S80 D81 L82 N83 E84 L85 L86 K87 K88 T89 L90 K91 ILE GLN ASP VAL GLY MET LEU VAL PRO MET GLY VAL MET SER GLY VAL VAL PRO LYS GLU ASP

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

ALA GLU LYS ILE LYS ALA LEU ALA VAL GLY THR VAL VAL GLU

• Molecule 35: Large ribosomal subunit protein mL37

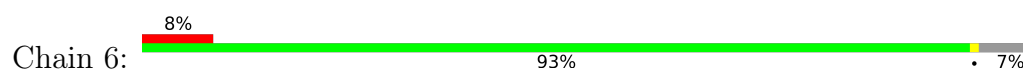


MET ALA LEU SER GLY PRO ARG ALA ALA ALA LEU ALA GLY SER GLN GLY LEU GLY LEU GLY PHE GLY ALA PRO ARG ARG GLY A30 K40 S41 E42 P45 L46 E56 P57 I58 I74 G81 Y82 K83 D84 R89 S90 P91 P92 L93 H94 E95 H96 P97 D101

G104 F107 H109 L137 D141 D142 P143 R144 E148 M149 E168 E169 I170 P171 K172 R173 E174 M206 S217 G226 G227 C268 D272 V273 K274 E281 G282 L294 D295 K296 A297 D332 D348 G349 D378 L389 T392 K393 K394 R395 V396

V397 V398 E399 P400 V401 A423

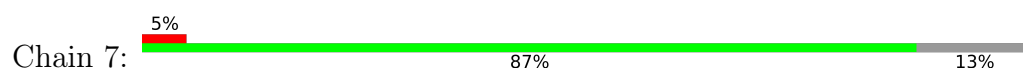
• Molecule 36: Large ribosomal subunit protein mL38



MET ALA ALA PRO TRP ARG ALA ALA LEU CYS GLU CYS ARG ARG TRP ARG GLY PHE SER SER SER VAL LEU GLY R27 D39 I40 D41 L42 S43 M44 R47 R59 E64 G79 E80 R81 T82 D83 P84 R85 E86 R87 R96 A115 R159 G180 E181

E207 E210 G211 D229 D276 D280 E283 E309 R370 D371 S372 H373 Y380

• Molecule 37: Large ribosomal subunit protein mL39



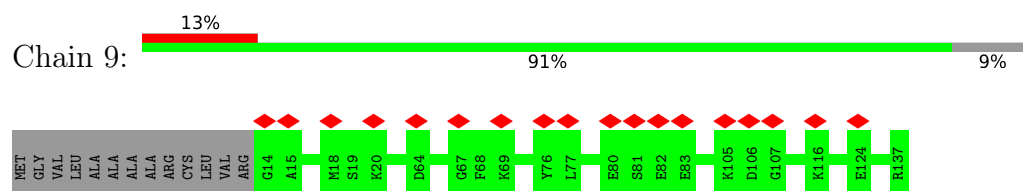
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D327 GLN SER LYS ALA THR GLU GLU CYS THR SER THR

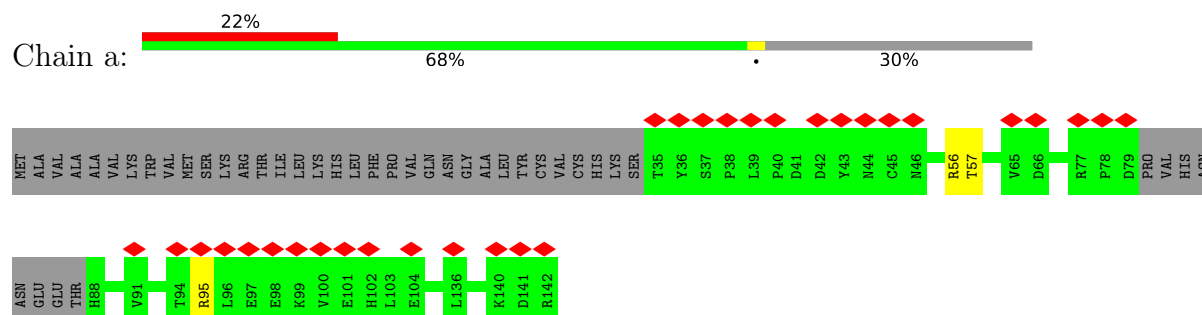
- Molecule 38: Large ribosomal subunit protein mL40



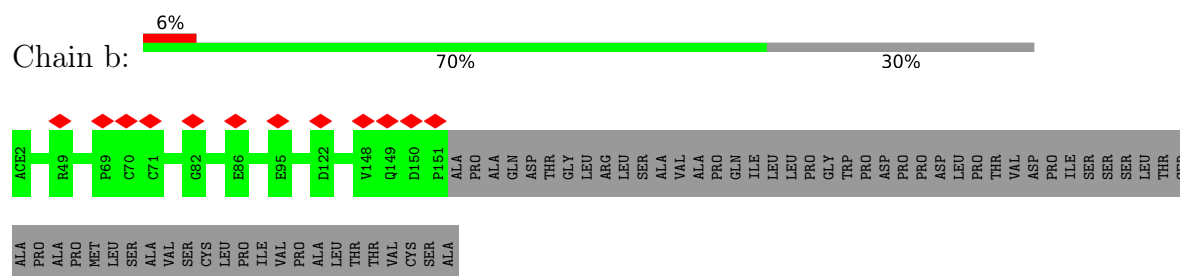
- Molecule 39: Large ribosomal subunit protein mL41



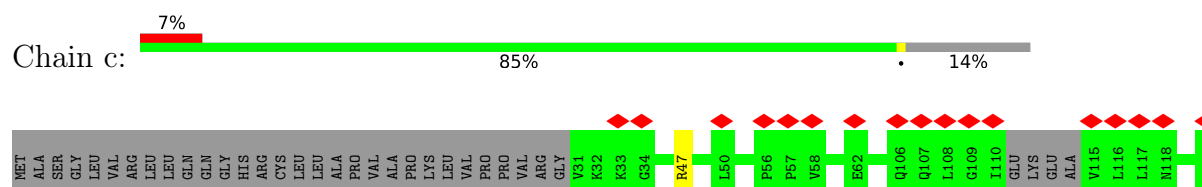
- Molecule 40: Large ribosomal subunit protein mL42

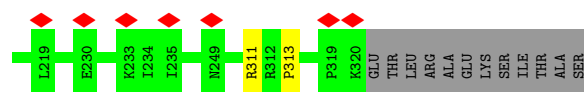


- Molecule 41: Large ribosomal subunit protein mL43

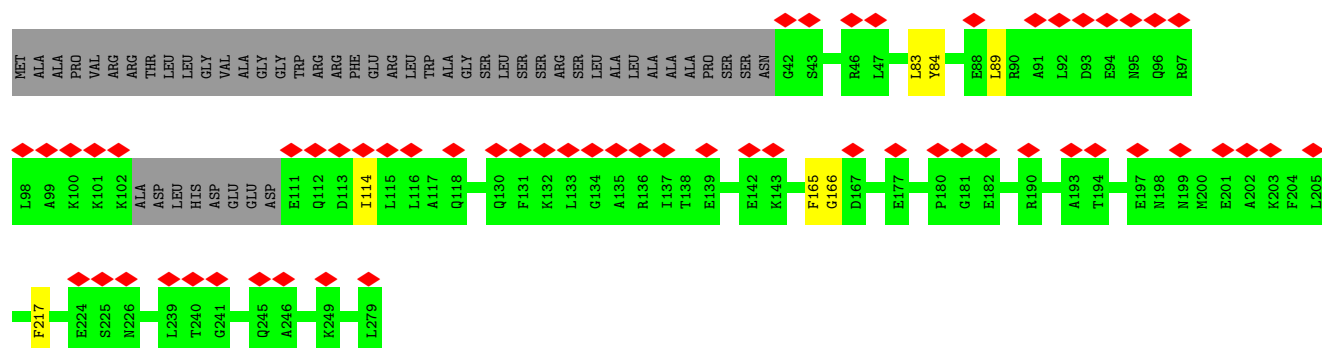
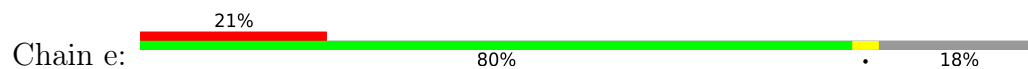


- Molecule 42: Large ribosomal subunit protein mL44

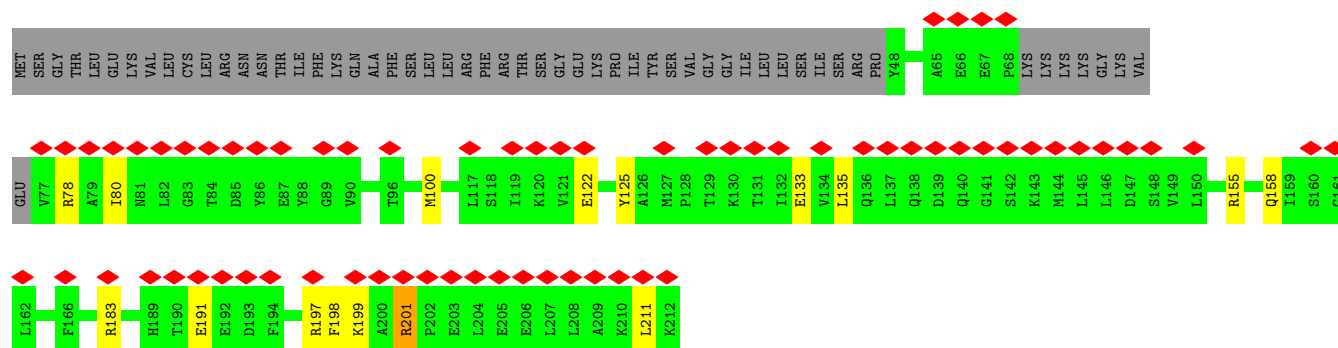




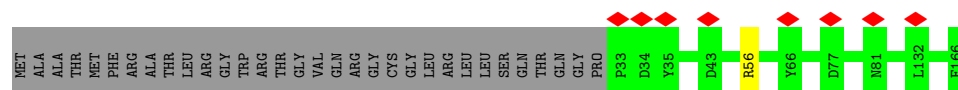
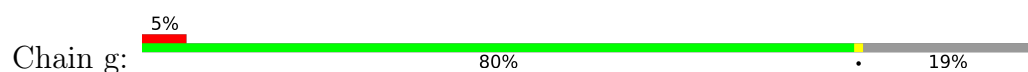
- Molecule 43: Large ribosomal subunit protein mL46



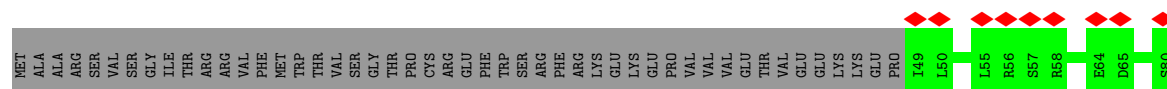
- Molecule 44: Large ribosomal subunit protein mL48

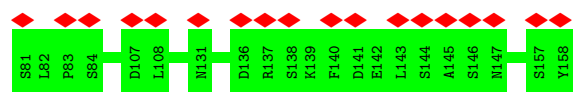


- Molecule 45: Large ribosomal subunit protein mL49

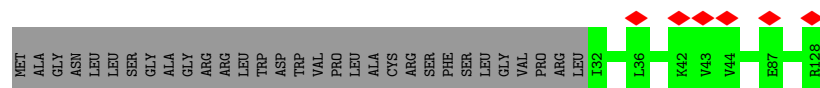
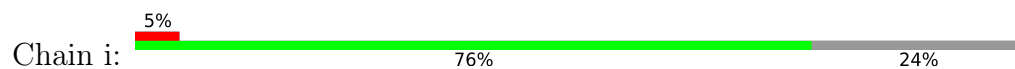


- Molecule 46: Large ribosomal subunit protein mL50

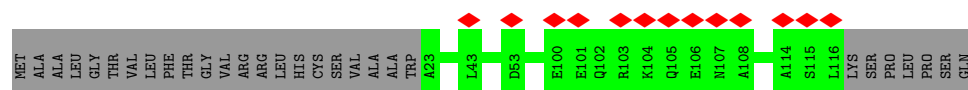
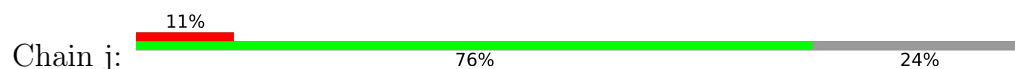




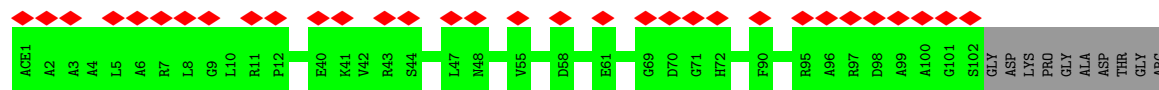
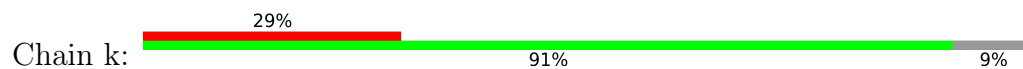
- Molecule 47: Large ribosomal subunit protein mL51



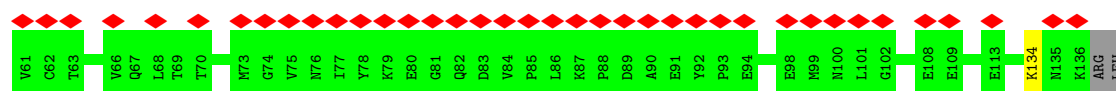
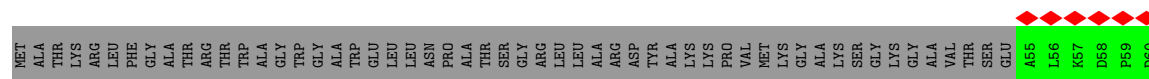
- Molecule 48: Large ribosomal subunit protein mL52



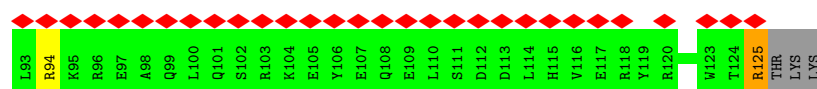
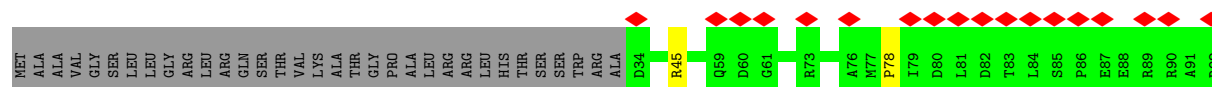
- Molecule 49: Large ribosomal subunit protein mL53



- Molecule 50: Large ribosomal subunit protein mL54



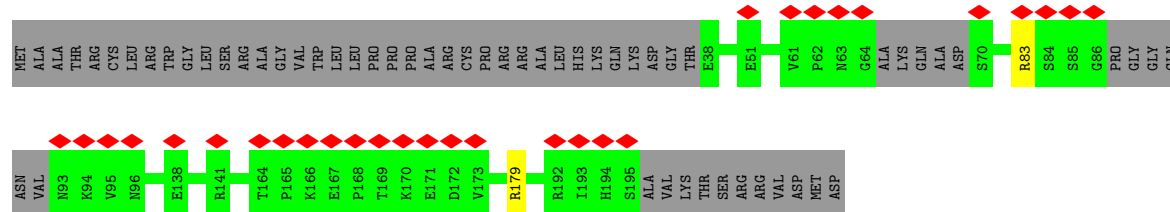
- Molecule 51: Large ribosomal subunit protein mL55



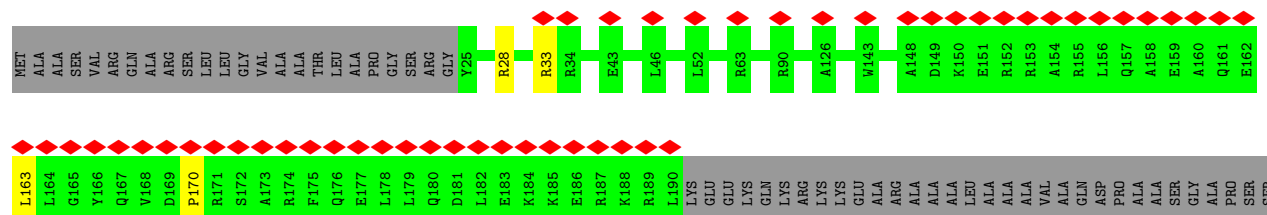
- Molecule 52: Large ribosomal subunit protein mL63

MET PHE LEU THR ALA LEU LEU TRP R9 Q91 S102

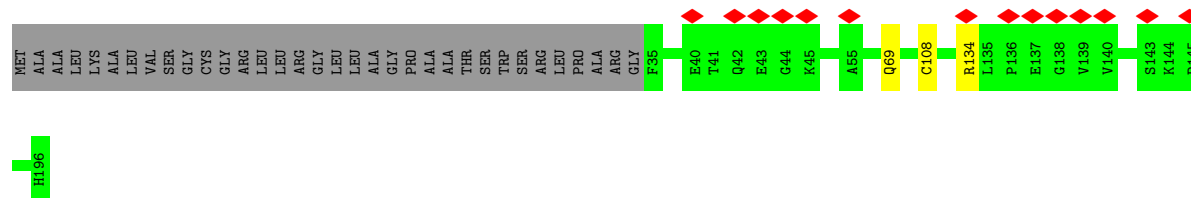
- Chain p: 

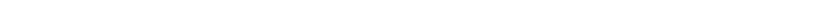


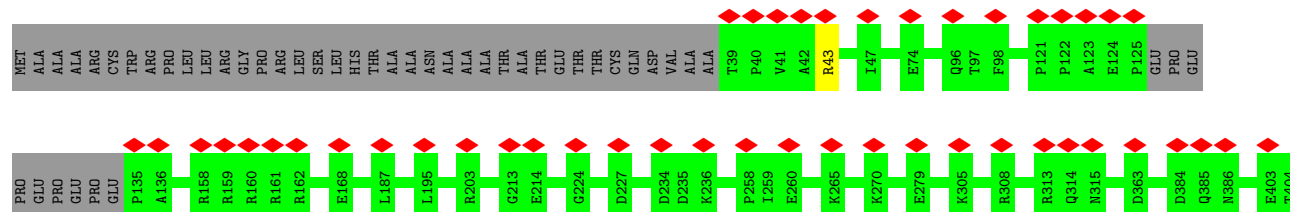
- Chain q: 

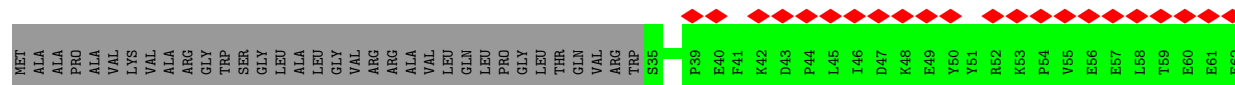


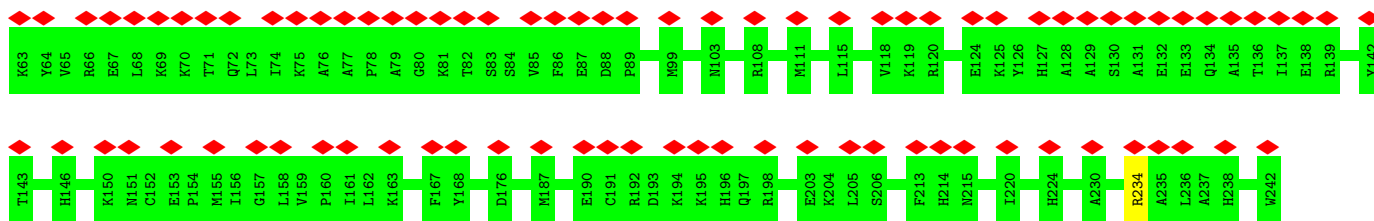
- Chain r: 



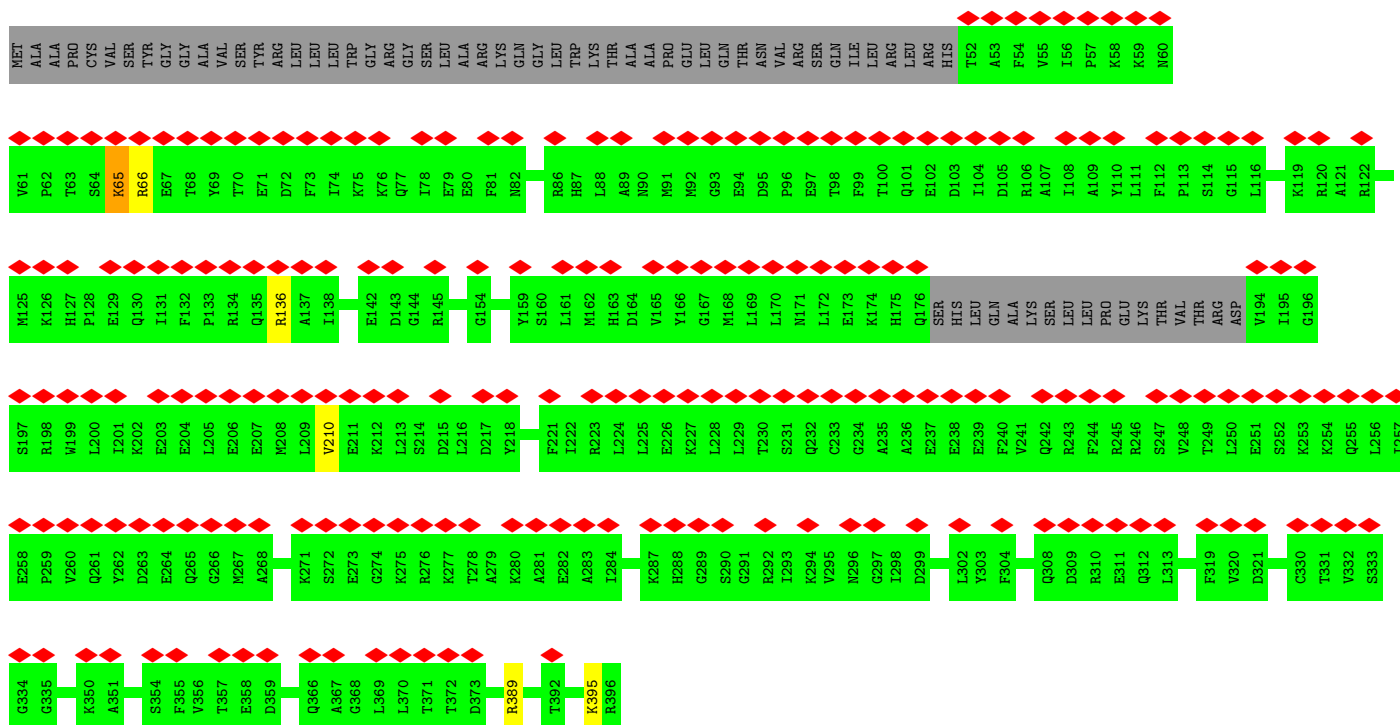
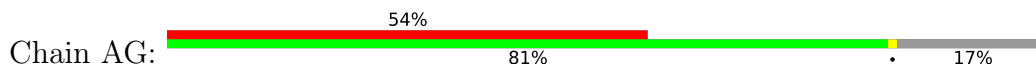
- Chain s: 



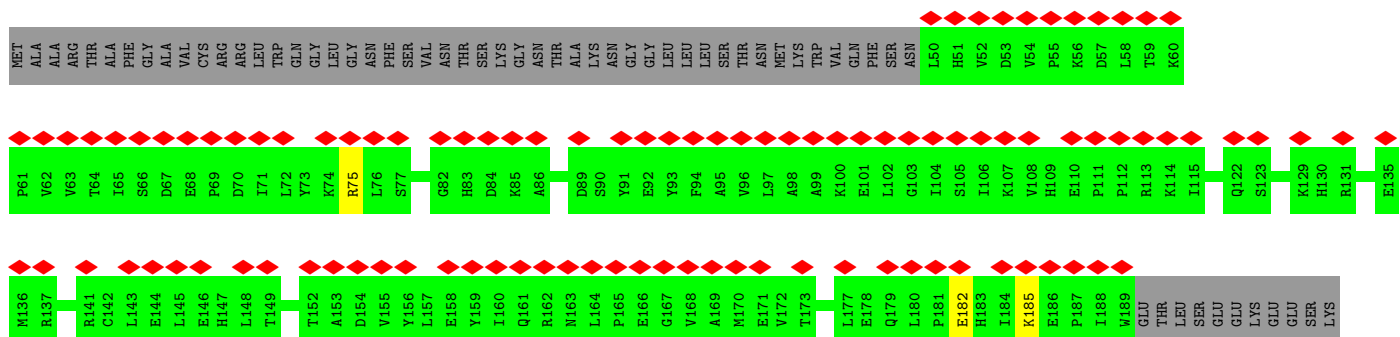
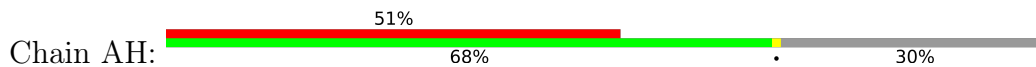




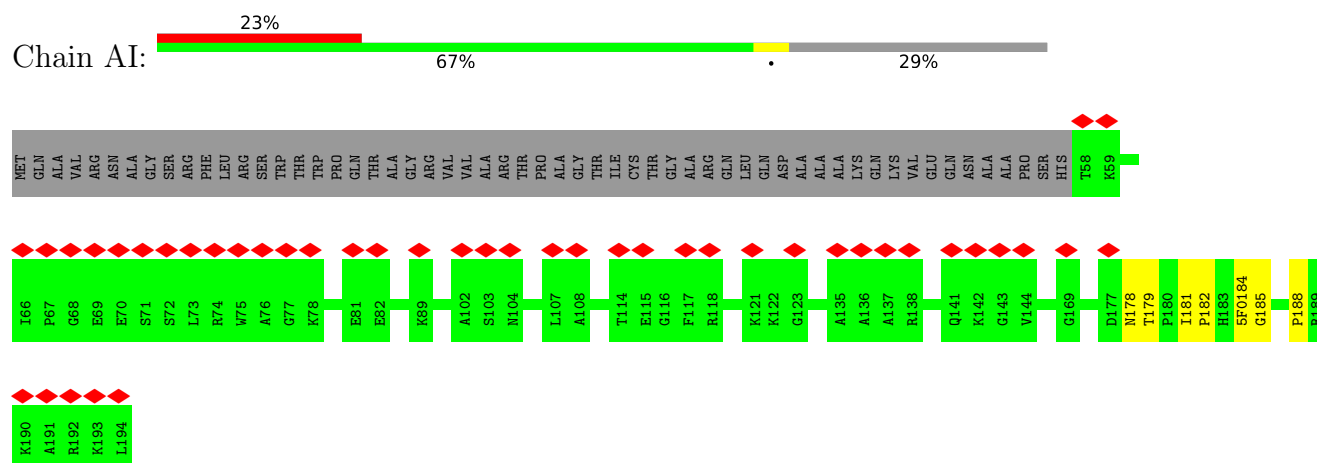
- Molecule 60: Small ribosomal subunit protein uS9m



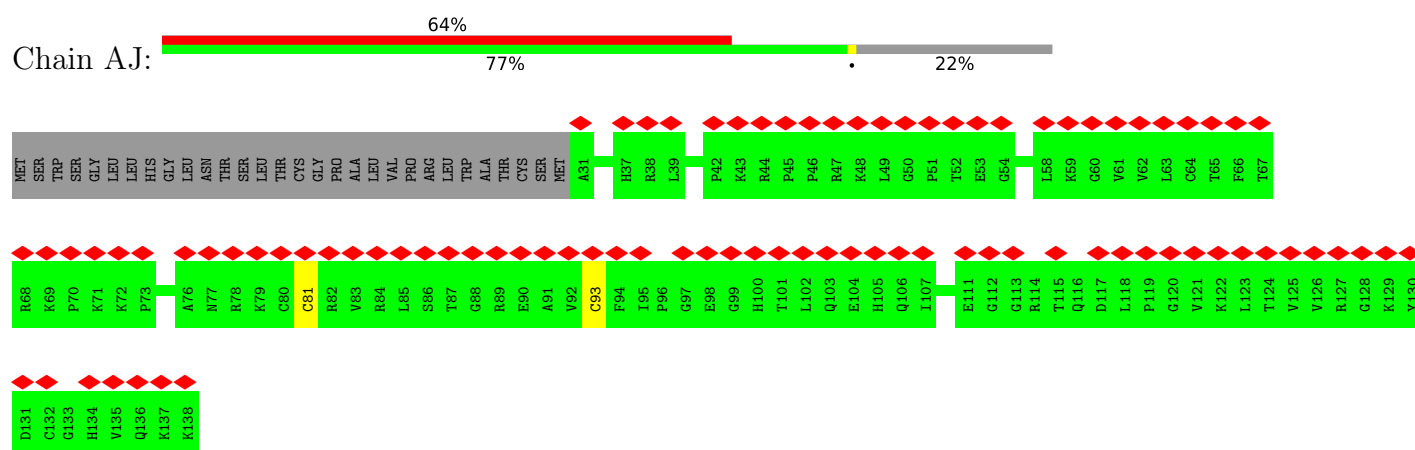
- Molecule 61: Small ribosomal subunit protein uS10m



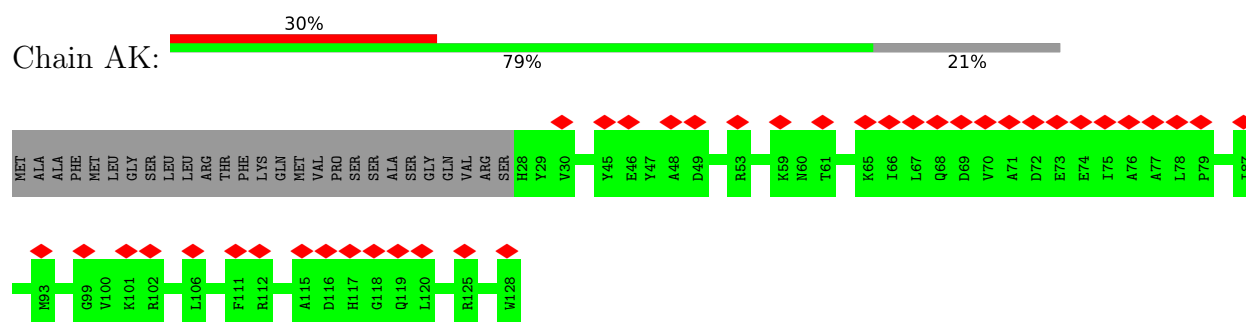
## ● Molecule 62: Small ribosomal subunit protein uS11m



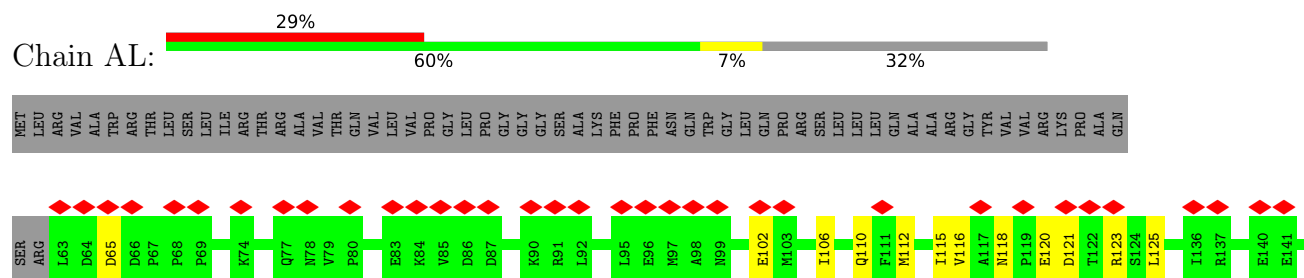
## ● Molecule 63: Small ribosomal subunit protein uS12m

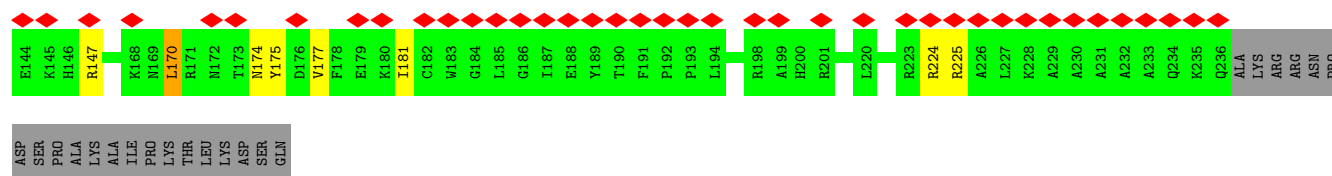


## ● Molecule 64: Small ribosomal subunit protein uS14m

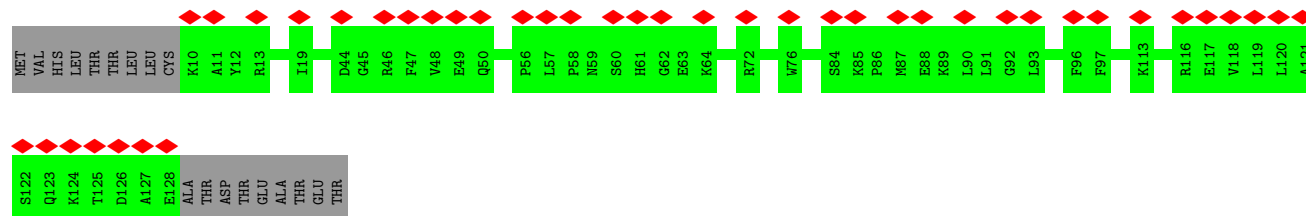


## ● Molecule 65: Small ribosomal subunit protein uS15m

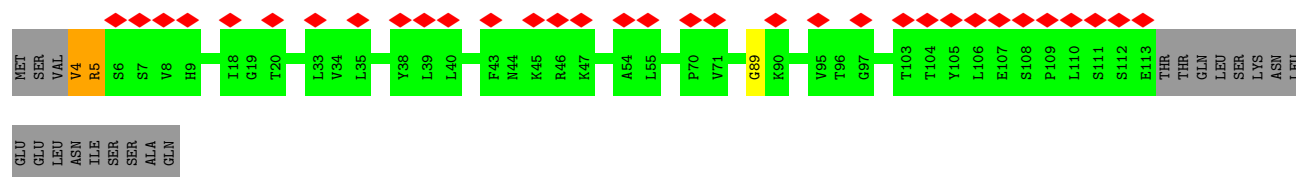
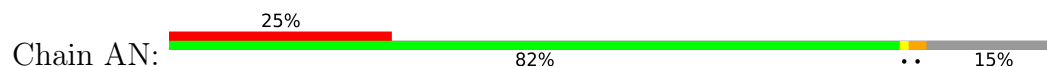




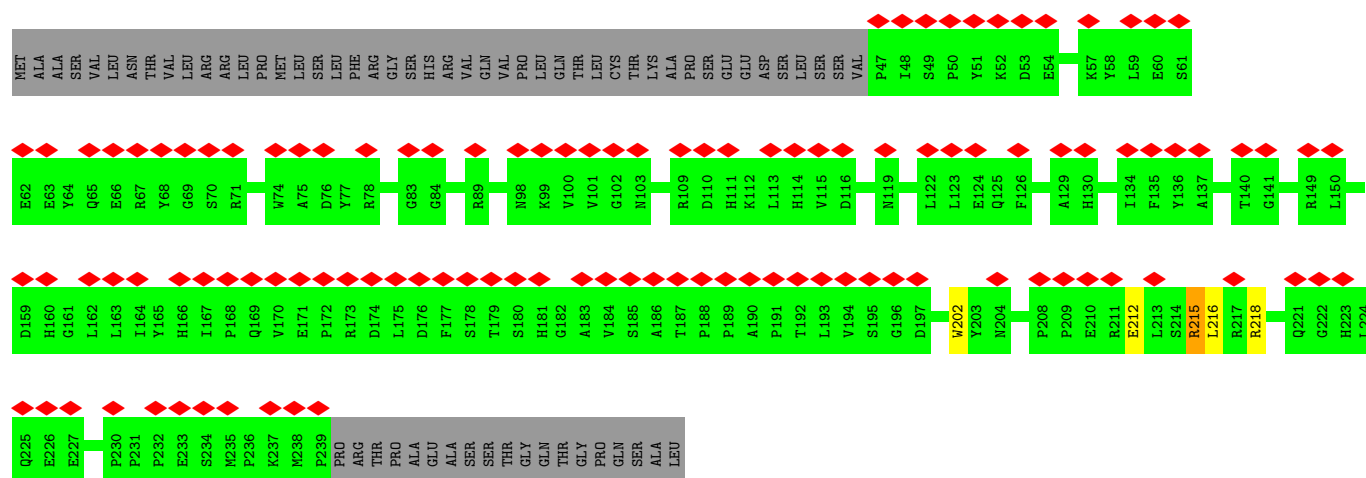
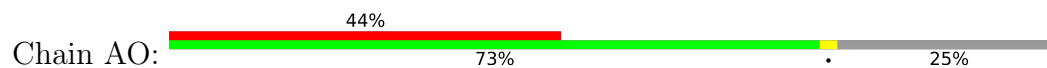
- Molecule 66: Small ribosomal subunit protein bS16m



- Molecule 67: Small ribosomal subunit protein uS17m

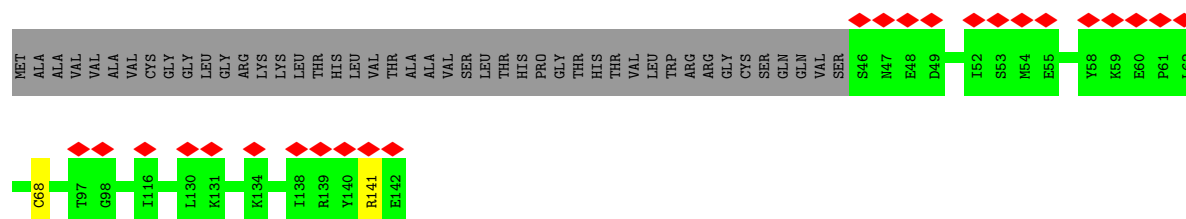


- Molecule 68: Small ribosomal subunit protein mS40



- Molecule 69: Small ribosomal subunit protein bS18m

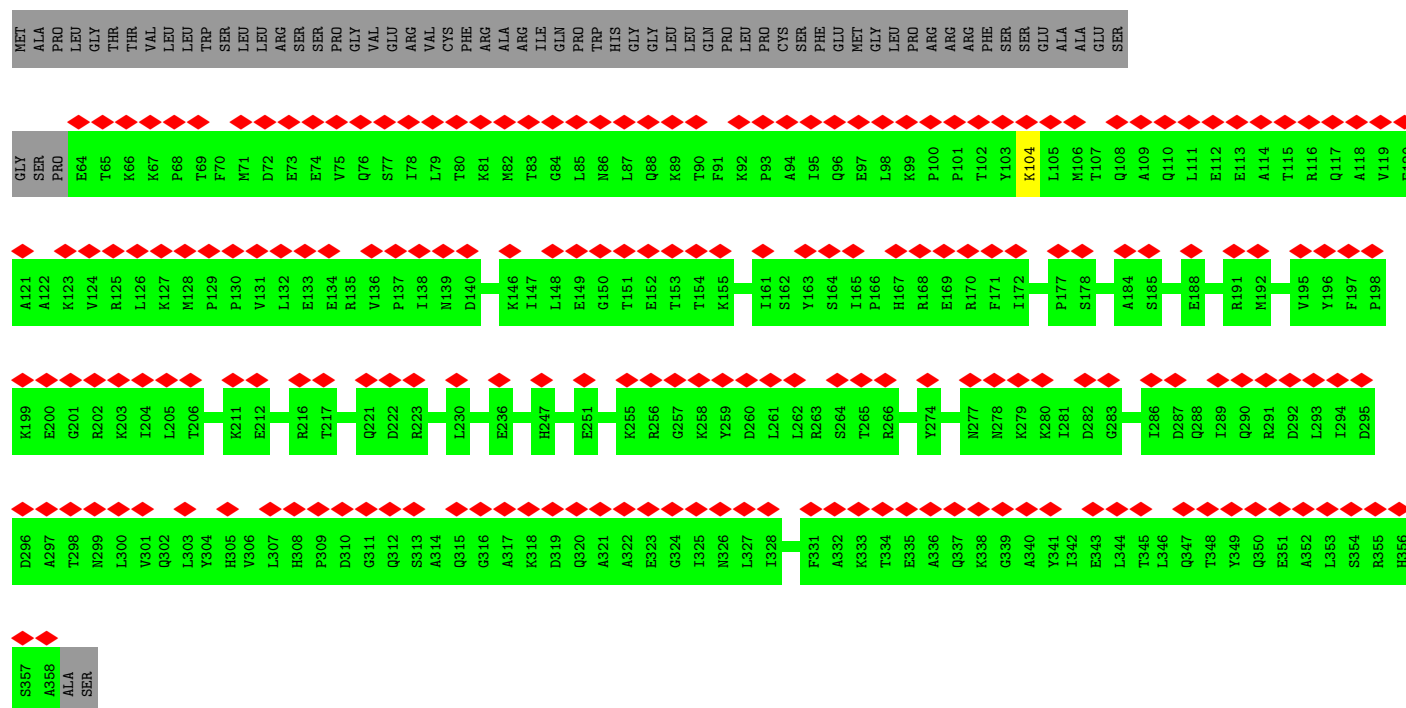
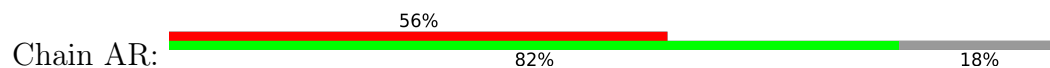




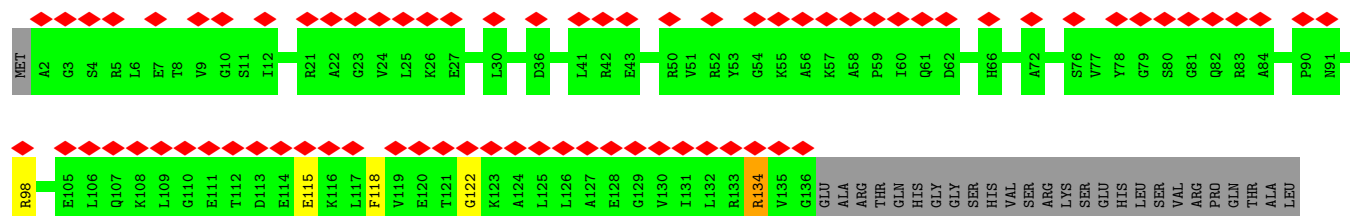
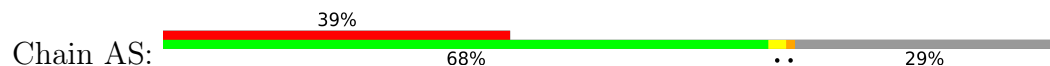
- Molecule 70: Small ribosomal subunit protein bS21m



- Molecule 71: Small ribosomal subunit protein mS22

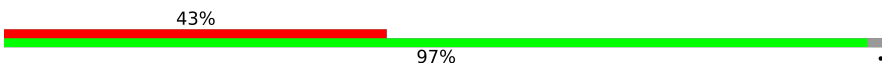


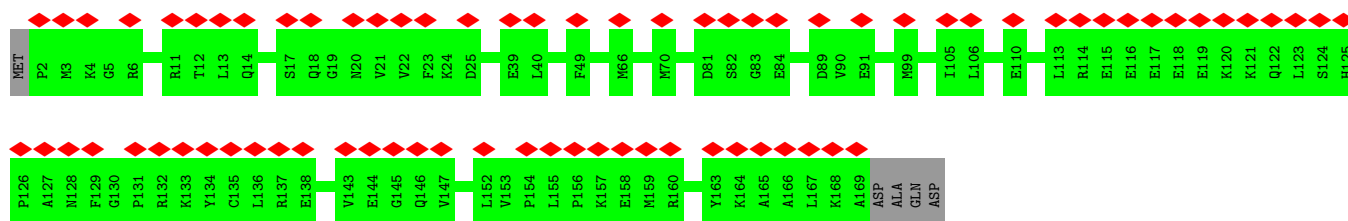
- Molecule 72: Small ribosomal subunit protein mS23



GLU  
GLU  
ASN  
GLU  
THR  
GLN  
LYS  
GLU  
VAL  
PRO  
GLN  
ASP  
GLN  
HIS  
LEU  
GLU  
ALA  
PRO  
PRO  
ALA  
ALA  
ASP  
GLN  
SER  
LYS  
GLY  
LEU  
LEU  
PRO

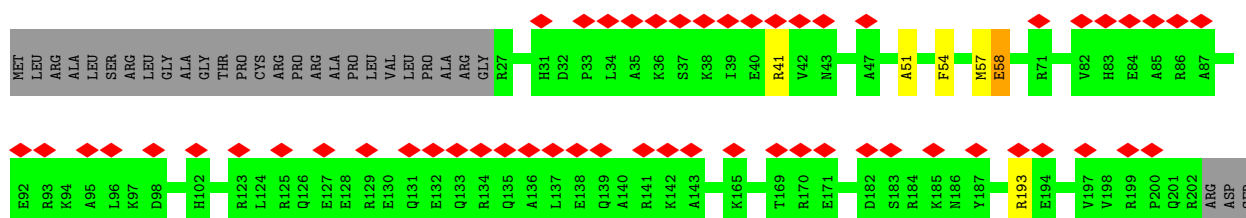
- Molecule 73: Small ribosomal subunit protein mS25

Chain AT: 

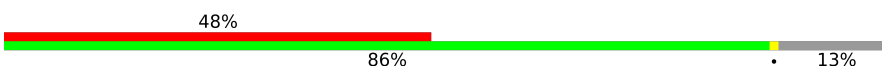


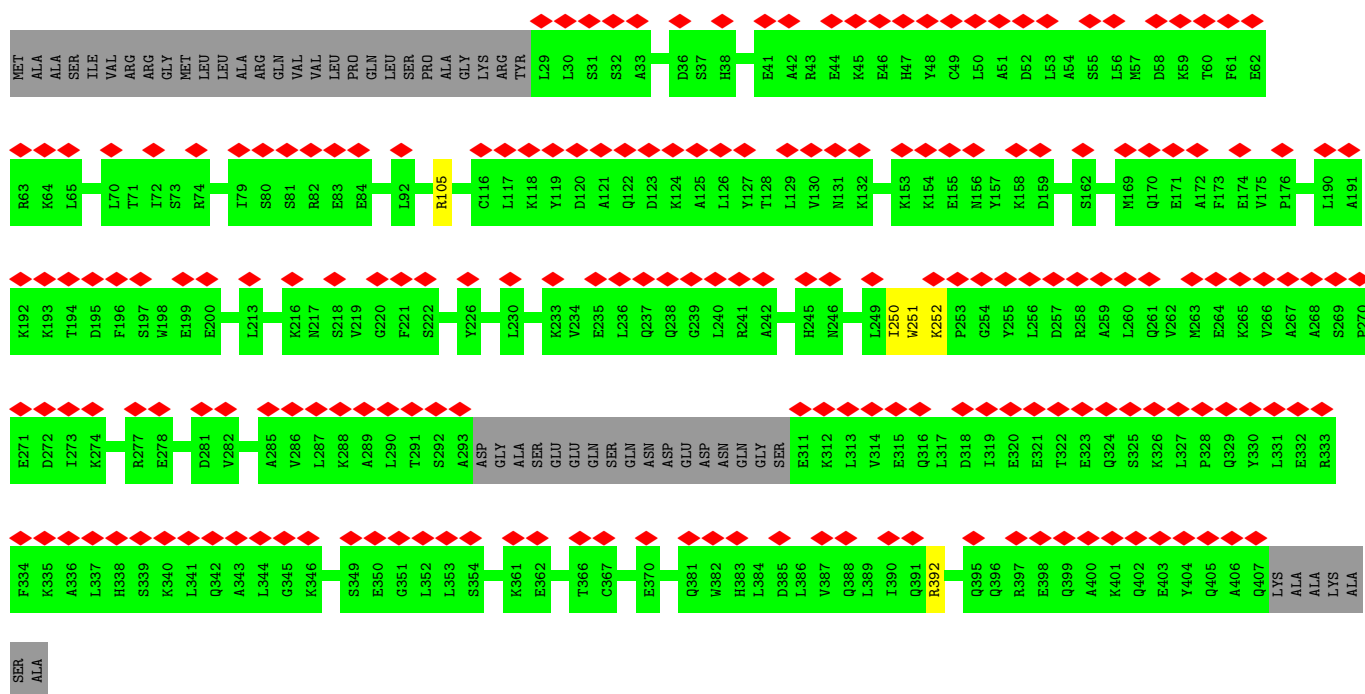
- Molecule 74: Small ribosomal subunit protein mS26

Chain AU: 

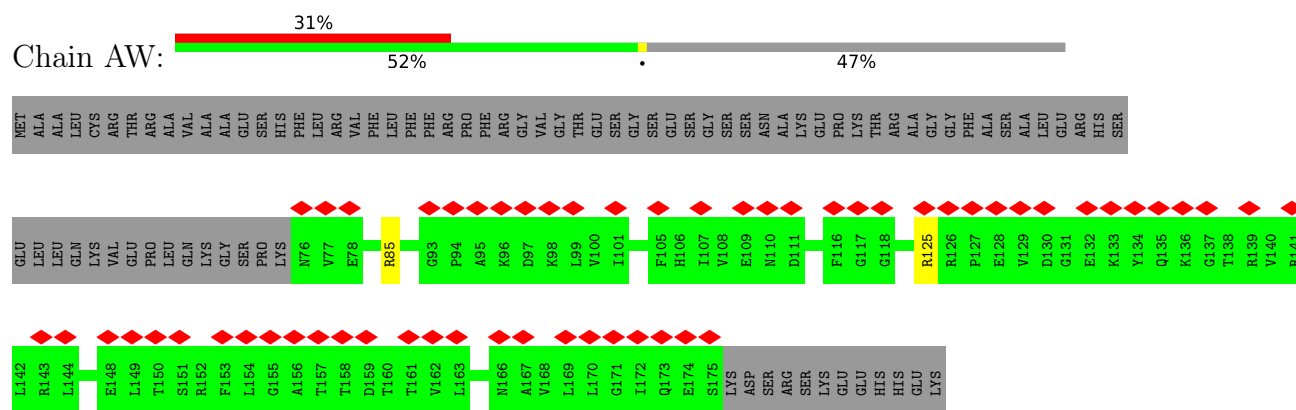


- Molecule 75: Small ribosomal subunit protein mS27

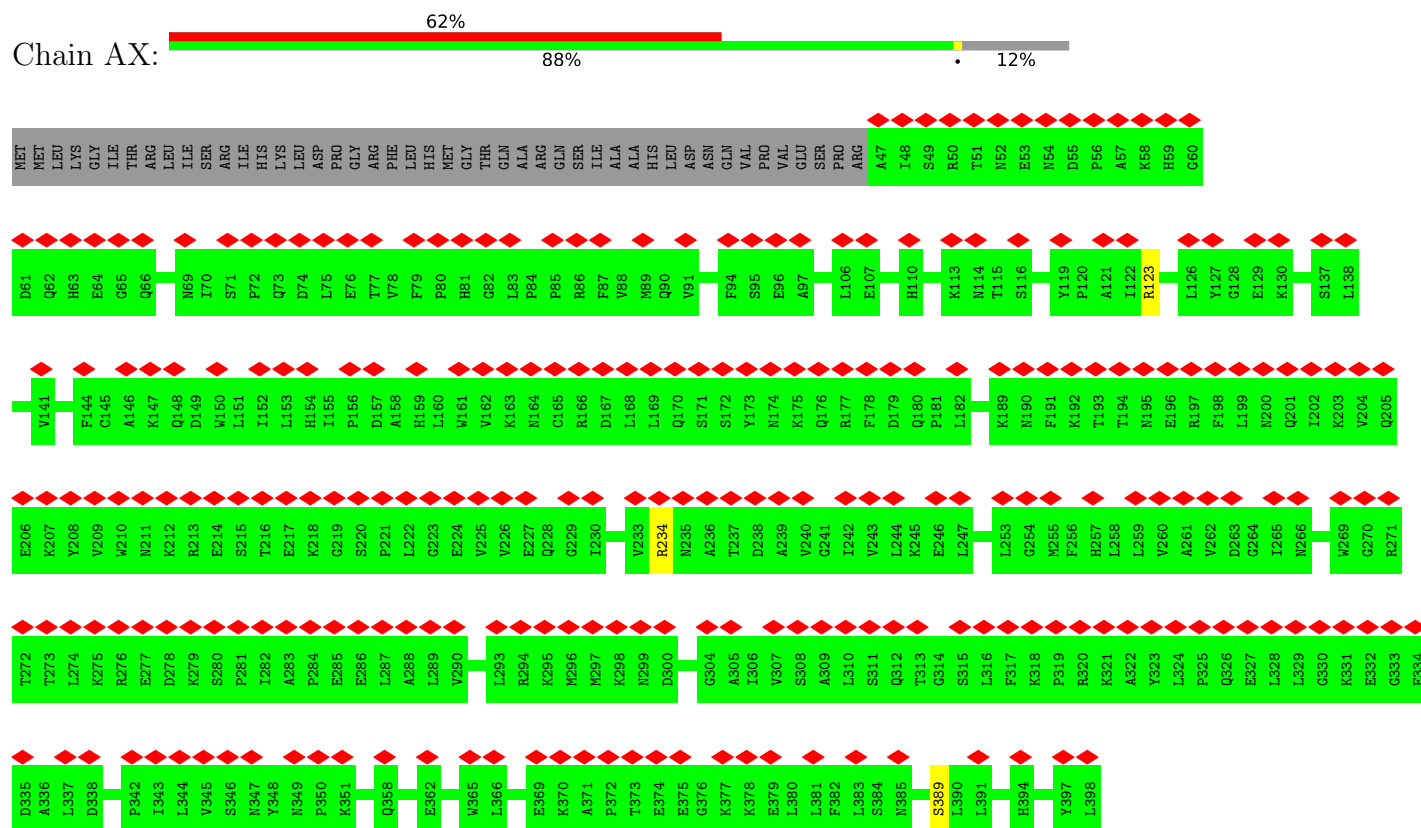
Chain AV: 



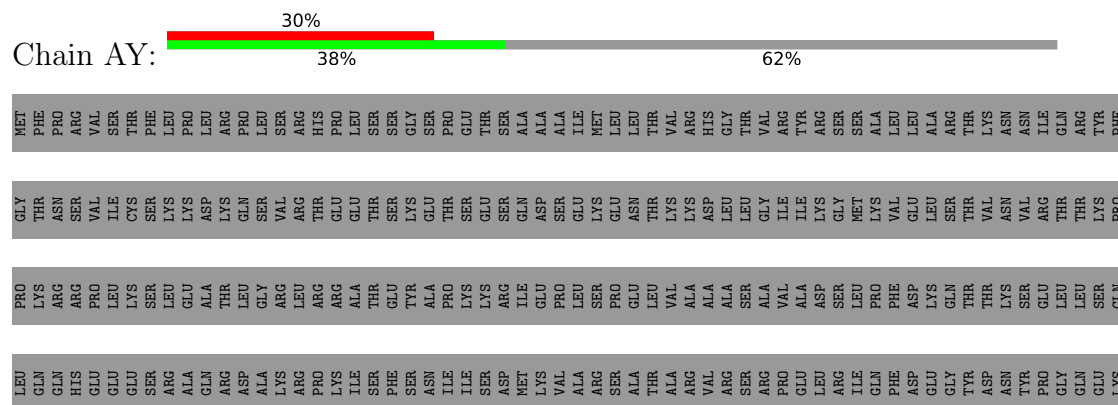
- Molecule 76: Small ribosomal subunit protein bS1m



- Molecule 77: Small ribosomal subunit protein mS29

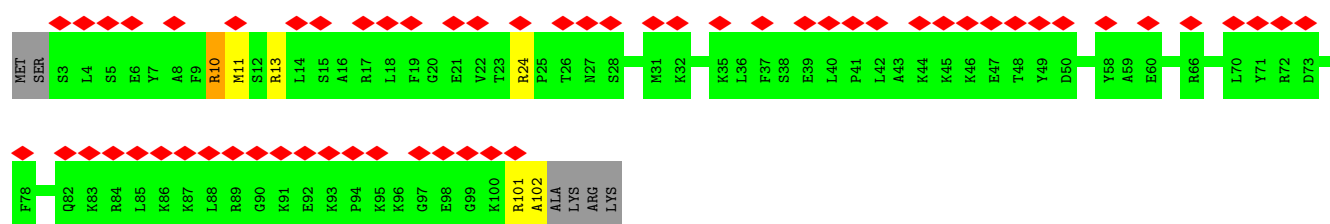
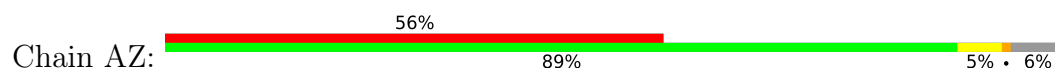


- Molecule 78: Small ribosomal subunit protein mS31

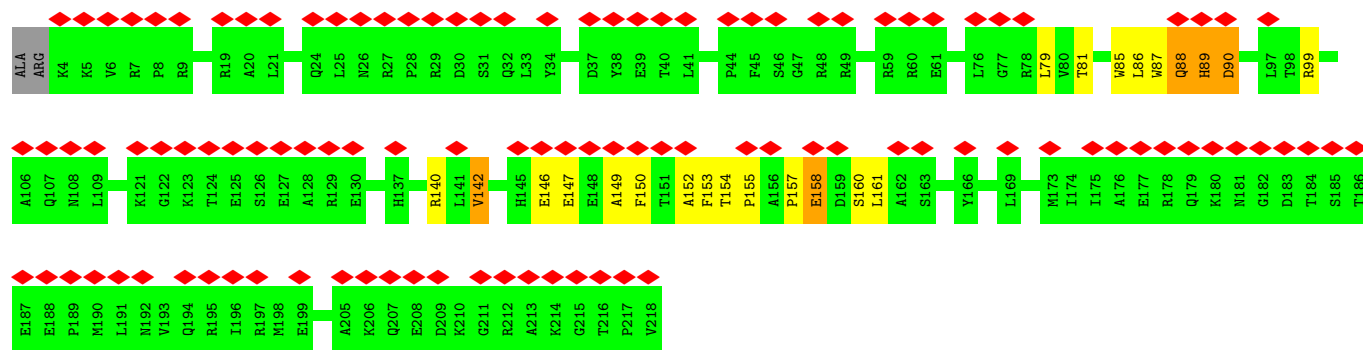
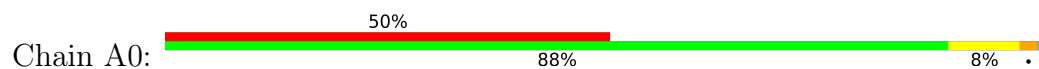




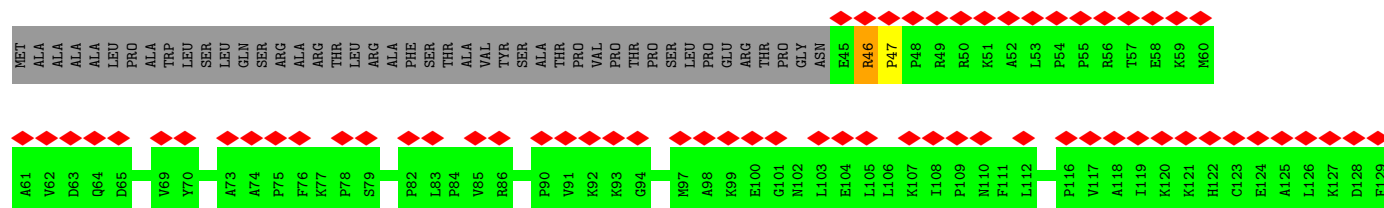
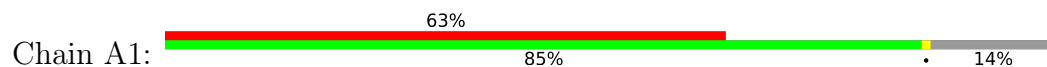
- Molecule 79: Small ribosomal subunit protein mS33

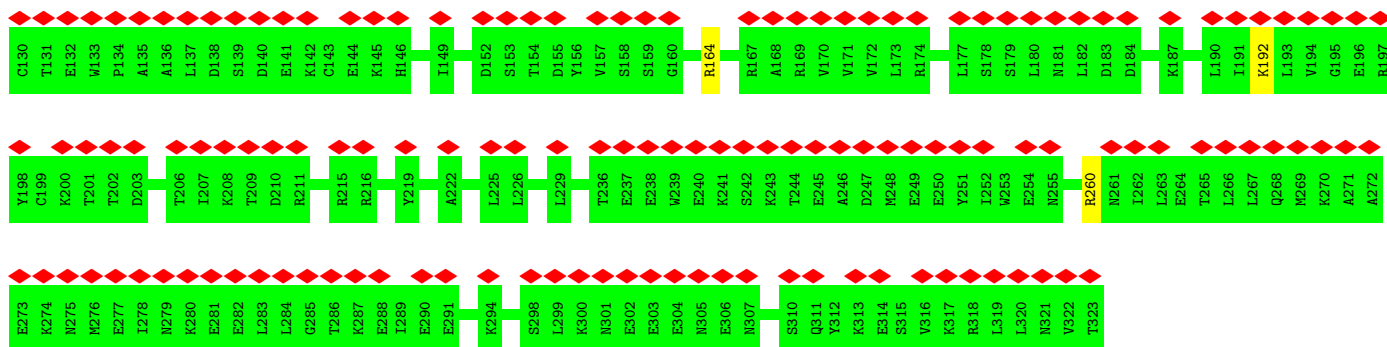


- Molecule 80: Small ribosomal subunit protein mS34



- Molecule 81: Small ribosomal subunit protein mS35





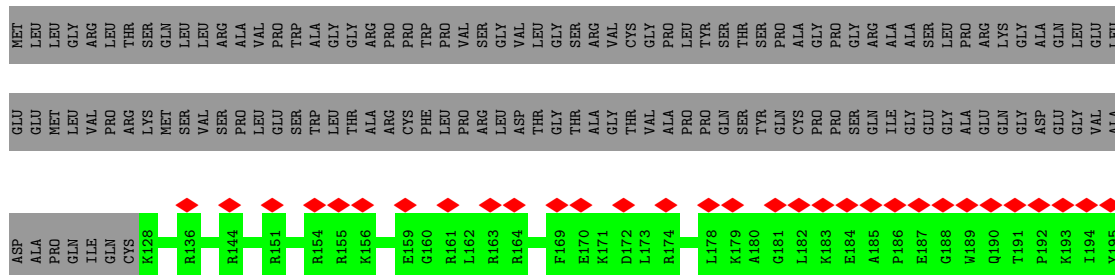
- Molecule 82: Small ribosomal subunit protein mS37

Chain A2: 80% 99%



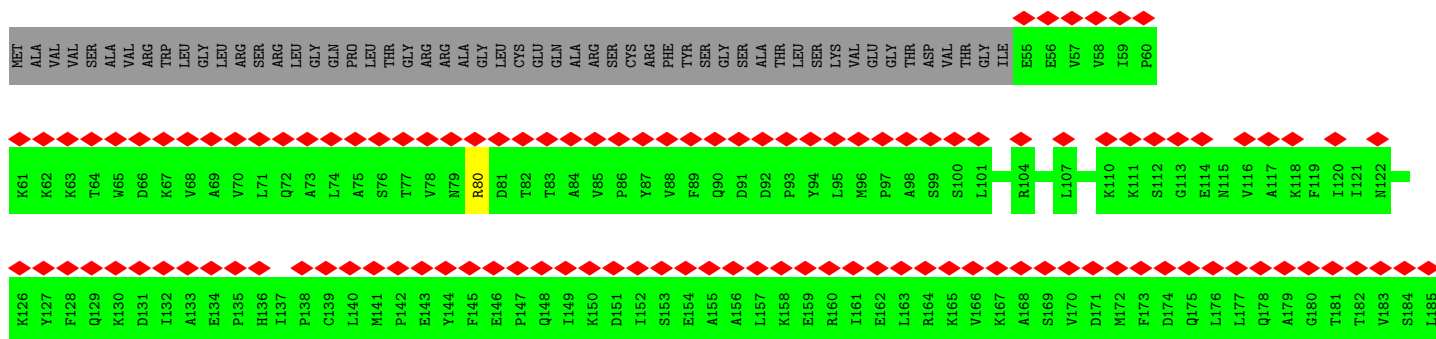
- Molecule 83: Small ribosomal subunit protein bS22, mitochondrial

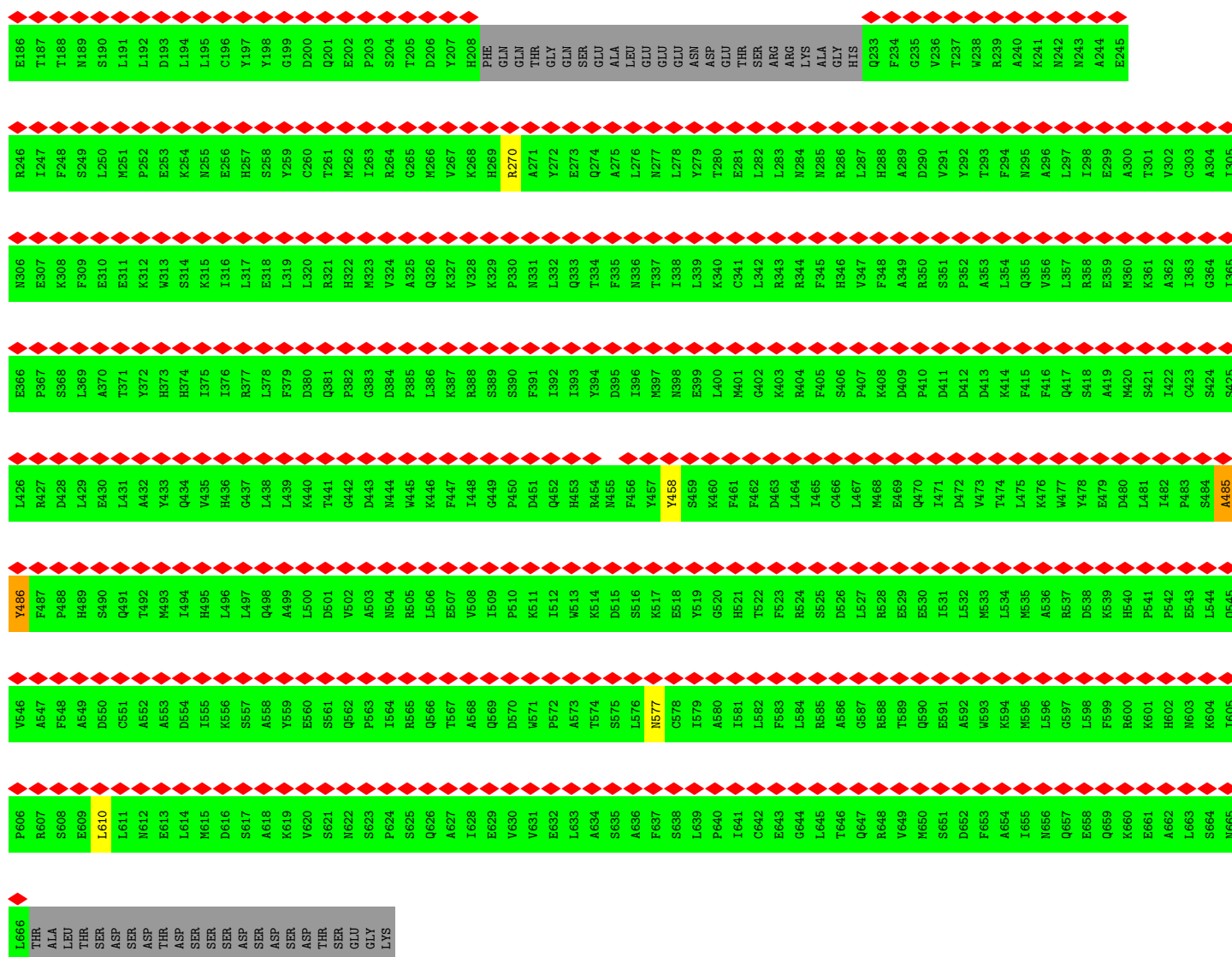
Chain A3: 17% 35% 65%



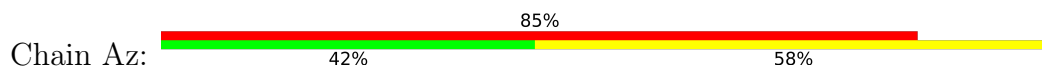
- Molecule 84: Small ribosomal subunit protein mS39

Chain A4: 83% 84% 15%

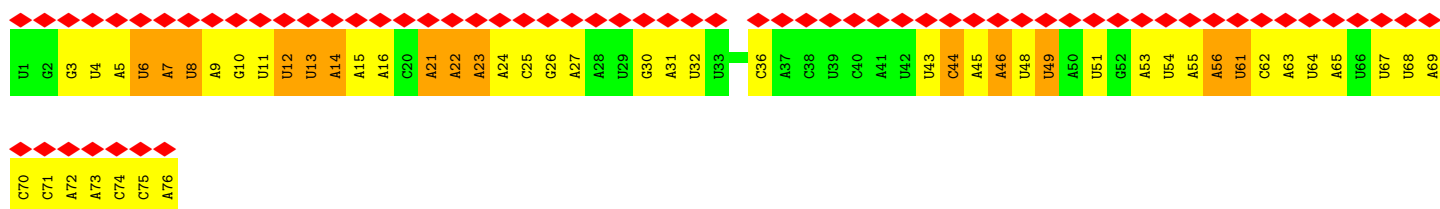




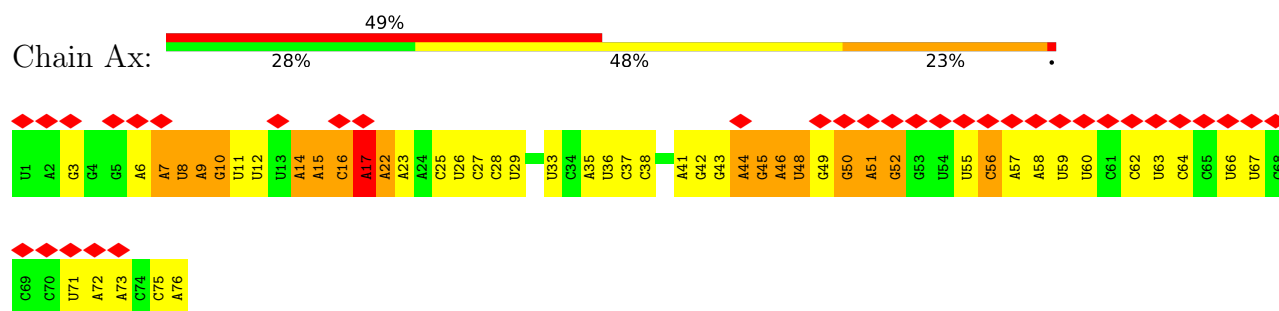
• Molecule 85: mRNA (Visualization example)



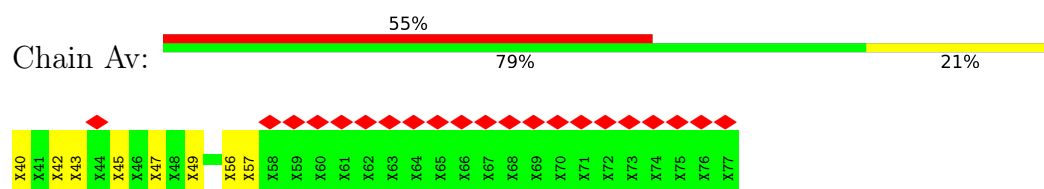
• Molecule 86: A-site tRNA (Visualisation example)



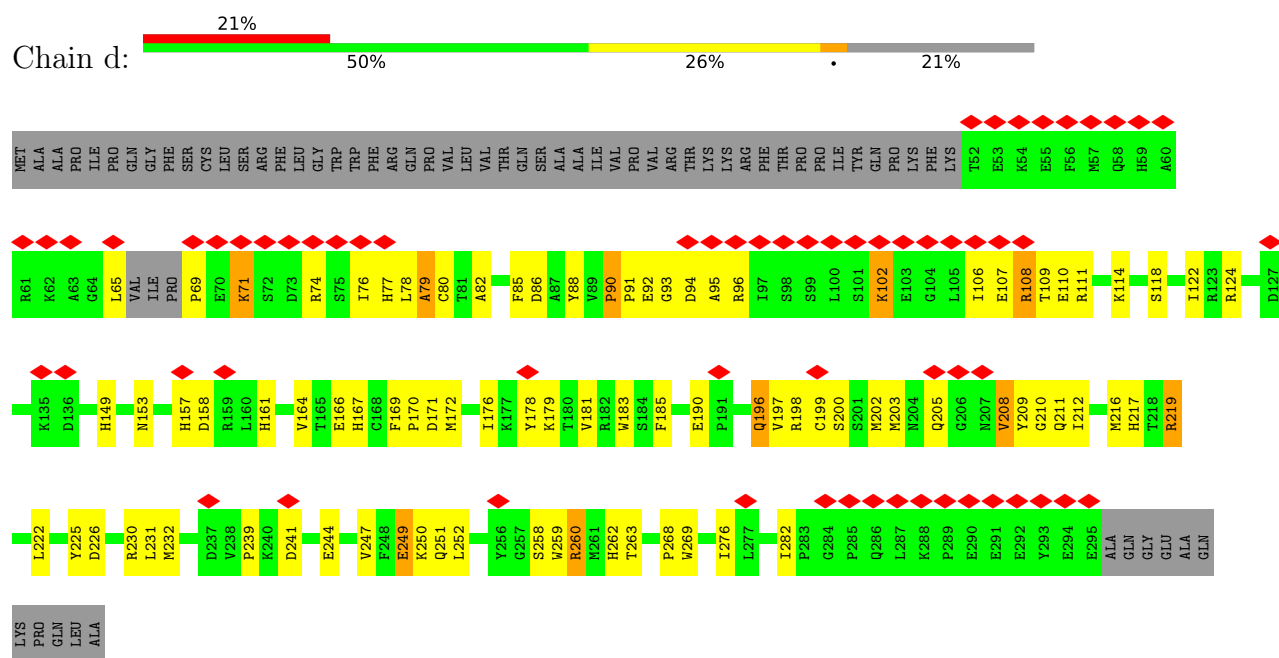
- Molecule 87: P-site tRNA (Visualisation example)



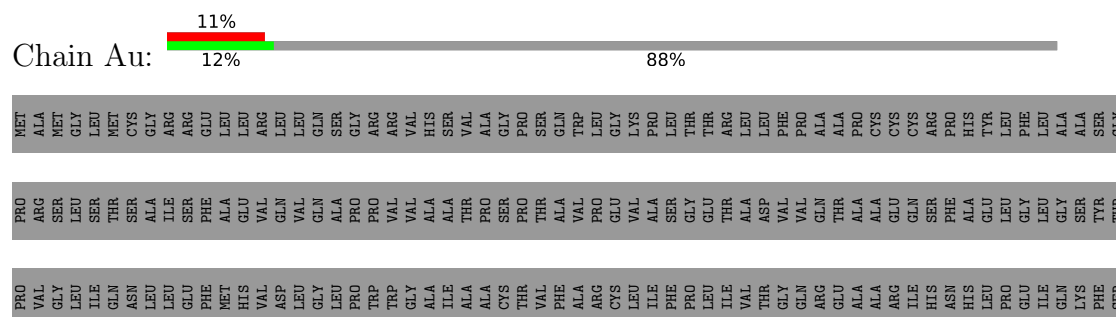
- Molecule 88: COX1 nascent chain



- Molecule 89: Large ribosomal subunit protein mL45



- Molecule 90: Mitochondrial inner membrane protein OXA1L





## 4 Experimental information

| Property                             | Value                                   | Source    |
|--------------------------------------|-----------------------------------------|-----------|
| EM reconstruction method             | SINGLE PARTICLE                         | Depositor |
| Imposed symmetry                     | POINT, Not provided                     |           |
| Number of particles used             | 23725                                   | Depositor |
| Resolution determination method      | FSC 0.143 CUT-OFF                       | Depositor |
| CTF correction method                | PHASE FLIPPING AND AMPLITUDE CORRECTION | Depositor |
| Microscope                           | TFS KRIOS                               | Depositor |
| Voltage (kV)                         | 300                                     | Depositor |
| Electron dose ( $e^-/\text{\AA}^2$ ) | 35                                      | Depositor |
| Minimum defocus (nm)                 | 200                                     | Depositor |
| Maximum defocus (nm)                 | 2000                                    | Depositor |
| Magnification                        | 59000                                   | Depositor |
| Image detector                       | FEI FALCON III (4k x 4k)                | Depositor |
| Maximum map value                    | 2.692                                   | Depositor |
| Minimum map value                    | -0.802                                  | Depositor |
| Average map value                    | 0.003                                   | Depositor |
| Map value standard deviation         | 0.156                                   | Depositor |
| Recommended contour level            | 0.7                                     | Depositor |
| Map size (Å)                         | 464.0, 464.0, 464.0                     | wwPDB     |
| Map dimensions                       | 400, 400, 400                           | wwPDB     |
| Map angles (°)                       | 90.0, 90.0, 90.0                        | wwPDB     |
| Pixel spacing (Å)                    | 1.16, 1.16, 1.16                        | Depositor |

## 5 Model quality ⓘ

### 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: 5MC, ATP, K, NAD, MG, PSU, OMG, FES, ZN, 2MG, MA6, 5MU, B8T, 5F0, ACE, 1MA, GDP, OMU

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     | 0.28         | 1/36876 (0.0%) | 0.41        | 3/57402 (0.0%) |
| 2   | B     | 0.22         | 0/1627         | 0.44        | 0/2527         |
| 3   | D     | 0.23         | 0/1896         | 0.46        | 0/2549         |
| 4   | E     | 0.25         | 0/2475         | 0.47        | 0/3355         |
| 5   | F     | 0.27         | 0/2090         | 0.48        | 0/2842         |
| 6   | H     | 0.23         | 0/1698         | 0.52        | 0/2292         |
| 7   | I     | 0.44         | 1/1731 (0.1%)  | 0.67        | 3/2345 (0.1%)  |
| 8   | J     | 0.34         | 0/1348         | 0.55        | 0/1813         |
| 9   | K     | 0.27         | 0/1497         | 0.42        | 0/2031         |
| 10  | L     | 0.21         | 0/905          | 0.45        | 0/1218         |
| 11  | M     | 0.26         | 0/2381         | 0.48        | 0/3212         |
| 12  | N     | 0.25         | 0/1833         | 0.47        | 0/2468         |
| 13  | O     | 0.26         | 0/1283         | 0.47        | 0/1727         |
| 14  | P     | 0.25         | 0/1199         | 0.46        | 0/1623         |
| 15  | Q     | 0.24         | 0/2039         | 0.49        | 0/2750         |
| 16  | R     | 0.32         | 0/1175         | 0.56        | 0/1572         |
| 17  | S     | 0.39         | 0/1320         | 0.62        | 0/1789         |
| 18  | T     | 0.27         | 0/1403         | 0.48        | 0/1886         |
| 19  | U     | 0.51         | 0/1280         | 1.06        | 10/1732 (0.6%) |
| 20  | V     | 0.51         | 0/1799         | 0.76        | 2/2438 (0.1%)  |
| 21  | W     | 0.29         | 0/902          | 0.46        | 0/1214         |
| 22  | X     | 0.24         | 0/2099         | 0.44        | 0/2837         |
| 23  | Y     | 0.29         | 0/1593         | 0.52        | 0/2136         |
| 24  | Z     | 0.25         | 0/1021         | 0.47        | 0/1378         |
| 25  | AA    | 0.21         | 0/22537        | 0.42        | 3/35085 (0.0%) |
| 26  | AB    | 0.20         | 0/1871         | 0.44        | 0/2531         |
| 27  | AC    | 0.19         | 0/1113         | 0.45        | 0/1505         |
| 28  | 0     | 0.25         | 0/913          | 0.46        | 0/1224         |
| 29  | 1     | 0.21         | 0/469          | 0.49        | 0/621          |
| 30  | 2     | 0.29         | 0/383          | 0.44        | 0/507          |
| 31  | 3     | 0.27         | 0/853          | 0.45        | 0/1136         |

| Mol | Chain | Bond lengths |               | Bond angles |               |
|-----|-------|--------------|---------------|-------------|---------------|
|     |       | RMSZ         | # Z  >5       | RMSZ        | # Z  >5       |
| 32  | 4     | 0.22         | 0/350         | 0.39        | 0/461         |
| 33  | z     | 0.25         | 0/2067        | 0.54        | 0/2793        |
| 34  | t     | 0.23         | 0/358         | 0.46        | 0/486         |
| 34  | u     | 0.25         | 0/259         | 0.54        | 0/350         |
| 34  | v     | 0.30         | 0/259         | 0.66        | 0/350         |
| 34  | w     | 0.33         | 0/246         | 0.67        | 0/331         |
| 34  | x     | 0.25         | 0/246         | 0.63        | 0/331         |
| 34  | y     | 0.29         | 0/246         | 0.57        | 0/331         |
| 35  | 5     | 0.25         | 0/3293        | 0.50        | 1/4484 (0.0%) |
| 36  | 6     | 0.23         | 0/3043        | 0.46        | 0/4140        |
| 37  | 7     | 0.27         | 0/2447        | 0.54        | 0/3310        |
| 38  | 8     | 0.63         | 1/1244 (0.1%) | 0.97        | 1/1674 (0.1%) |
| 39  | 9     | 0.24         | 0/1025        | 0.48        | 0/1379        |
| 40  | a     | 0.28         | 0/866         | 0.57        | 0/1174        |
| 41  | b     | 0.23         | 0/1219        | 0.43        | 0/1651        |
| 42  | c     | 0.25         | 0/2347        | 0.48        | 0/3171        |
| 43  | e     | 0.26         | 0/1903        | 0.60        | 0/2565        |
| 44  | f     | 0.33         | 0/1273        | 0.71        | 0/1716        |
| 45  | g     | 0.25         | 0/1151        | 0.48        | 0/1569        |
| 46  | h     | 0.20         | 0/918         | 0.40        | 0/1249        |
| 47  | i     | 0.27         | 0/850         | 0.45        | 0/1135        |
| 48  | j     | 0.24         | 0/760         | 0.49        | 0/1023        |
| 49  | k     | 0.18         | 0/783         | 0.41        | 0/1057        |
| 50  | l     | 0.19         | 0/707         | 0.47        | 0/960         |
| 51  | m     | 0.24         | 0/805         | 0.58        | 0/1081        |
| 52  | o     | 0.26         | 0/819         | 0.47        | 0/1097        |
| 53  | p     | 0.23         | 0/1223        | 0.44        | 0/1641        |
| 54  | q     | 0.25         | 0/1432        | 0.48        | 0/1931        |
| 55  | r     | 0.25         | 0/1362        | 0.47        | 0/1846        |
| 56  | s     | 0.23         | 0/3239        | 0.46        | 0/4400        |
| 57  | AD    | 0.18         | 0/2751        | 0.40        | 0/3681        |
| 58  | AE    | 0.22         | 0/989         | 0.50        | 0/1335        |
| 59  | AF    | 0.21         | 0/1767        | 0.47        | 0/2373        |
| 60  | AG    | 0.21         | 0/2753        | 0.48        | 1/3691 (0.0%) |
| 61  | AH    | 0.23         | 0/1178        | 0.52        | 0/1598        |
| 62  | AI    | 0.36         | 0/1030        | 0.48        | 0/1386        |
| 63  | AJ    | 0.28         | 0/855         | 0.60        | 2/1148 (0.2%) |
| 64  | AK    | 0.20         | 0/880         | 0.44        | 0/1182        |
| 65  | AL    | 0.33         | 0/1477        | 0.73        | 1/1974 (0.1%) |
| 66  | AM    | 0.21         | 0/963         | 0.46        | 0/1295        |
| 67  | AN    | 0.31         | 0/886         | 0.62        | 2/1199 (0.2%) |
| 68  | AO    | 0.21         | 0/1648        | 0.48        | 0/2243        |
| 69  | AP    | 0.23         | 0/798         | 0.52        | 0/1070        |

| Mol | Chain | Bond lengths |                 | Bond angles |                  |
|-----|-------|--------------|-----------------|-------------|------------------|
|     |       | RMSZ         | # Z  >5         | RMSZ        | # Z  >5          |
| 70  | AQ    | 0.19         | 0/754           | 0.38        | 0/1003           |
| 71  | AR    | 0.22         | 0/2456          | 0.48        | 0/3317           |
| 72  | AS    | 0.27         | 0/1138          | 0.67        | 0/1533           |
| 73  | AT    | 0.20         | 0/1402          | 0.47        | 0/1883           |
| 74  | AU    | 0.27         | 0/1510          | 0.59        | 1/2025 (0.0%)    |
| 75  | AV    | 0.22         | 0/3030          | 0.45        | 0/4093           |
| 76  | AW    | 0.20         | 0/801           | 0.45        | 0/1079           |
| 77  | AX    | 0.21         | 0/2921          | 0.45        | 0/3954           |
| 78  | AY    | 0.22         | 0/1280          | 0.49        | 0/1725           |
| 79  | AZ    | 0.23         | 0/857           | 0.57        | 0/1141           |
| 80  | A0    | 0.44         | 0/1834          | 0.77        | 6/2484 (0.2%)    |
| 81  | A1    | 0.23         | 0/2313          | 0.50        | 0/3129           |
| 82  | A2    | 0.21         | 0/947           | 0.47        | 0/1266           |
| 83  | A3    | 0.24         | 0/636           | 0.52        | 0/839            |
| 84  | A4    | 0.23         | 0/4877          | 0.49        | 1/6598 (0.0%)    |
| 85  | Az    | 0.20         | 0/785           | 0.45        | 0/1219           |
| 86  | Aw    | 0.47         | 0/1604          | 0.73        | 0/2490           |
| 87  | Ax    | 0.42         | 0/1673          | 0.79        | 1/2599 (0.0%)    |
| 89  | d     | 0.69         | 0/2018          | 1.17        | 7/2725 (0.3%)    |
| 90  | Au    | 0.26         | 0/439           | 0.55        | 0/586            |
| All | All   | 0.28         | 3/189599 (0.0%) | 0.51        | 45/269294 (0.0%) |

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 |
|-----|-------|---------------------|---------------------|
| 5   | F     | 0                   | 1                   |
| 6   | H     | 0                   | 2                   |
| 8   | J     | 0                   | 2                   |
| 12  | N     | 0                   | 2                   |
| 14  | P     | 0                   | 1                   |
| 15  | Q     | 0                   | 1                   |
| 18  | T     | 0                   | 1                   |
| 19  | U     | 0                   | 6                   |
| 22  | X     | 0                   | 2                   |
| 33  | z     | 0                   | 1                   |
| 36  | 6     | 0                   | 2                   |
| 37  | 7     | 0                   | 1                   |
| 38  | 8     | 0                   | 5                   |
| 40  | a     | 0                   | 1                   |

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| Mol | Chain | #Chirality outliers | #Planarity outliers |
|-----|-------|---------------------|---------------------|
| 42  | c     | 0                   | 2                   |
| 44  | f     | 0                   | 4                   |
| 45  | g     | 0                   | 1                   |
| 51  | m     | 0                   | 2                   |
| 53  | p     | 0                   | 2                   |
| 54  | q     | 0                   | 2                   |
| 55  | r     | 0                   | 1                   |
| 56  | s     | 0                   | 1                   |
| 57  | AD    | 0                   | 1                   |
| 60  | AG    | 0                   | 2                   |
| 61  | AH    | 0                   | 1                   |
| 65  | AL    | 0                   | 4                   |
| 68  | AO    | 0                   | 1                   |
| 69  | AP    | 0                   | 1                   |
| 72  | AS    | 0                   | 2                   |
| 74  | AU    | 0                   | 2                   |
| 75  | AV    | 0                   | 2                   |
| 76  | AW    | 0                   | 2                   |
| 77  | AX    | 0                   | 1                   |
| 79  | AZ    | 0                   | 4                   |
| 80  | A0    | 0                   | 1                   |
| 81  | A1    | 0                   | 3                   |
| 84  | A4    | 0                   | 3                   |
| 89  | d     | 0                   | 2                   |
| All | All   | 0                   | 75                  |

All (3) bond length outliers are listed below:

| Mol | Chain | Res  | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|------|------|-------|-------|-------------|----------|
| 7   | I     | 64   | CYS  | CA-CB | 6.88  | 1.65        | 1.53     |
| 38  | 8     | 98   | ALA  | C-N   | -6.41 | 1.25        | 1.33     |
| 1   | A     | 1804 | A    | C5-C6 | -5.81 | 1.29        | 1.41     |

All (45) bond angle outliers are listed below:

| Mol | Chain | Res | Type | Atoms     | Z      | Observed(°) | Ideal(°) |
|-----|-------|-----|------|-----------|--------|-------------|----------|
| 7   | I     | 64  | CYS  | CA-CB-SG  | 11.64  | 141.17      | 114.40   |
| 25  | AA    | 883 | A    | OP1-P-O3' | -11.61 | 73.16       | 108.00   |
| 89  | d     | 90  | PRO  | N-CA-C    | -9.91  | 98.61       | 110.70   |
| 35  | 5     | 104 | CYS  | CA-CB-SG  | 8.90   | 134.88      | 114.40   |
| 19  | U     | 115 | ASP  | CB-CA-C   | -8.78  | 96.97       | 110.92   |
| 25  | AA    | 883 | A    | OP2-P-O3' | -8.65  | 82.04       | 108.00   |

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| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 80  | A0    | 88   | GLN  | N-CA-C      | 8.28  | 121.93      | 111.24   |
| 89  | d     | 108  | ARG  | N-CA-C      | -7.94 | 102.63      | 111.28   |
| 19  | U     | 115  | ASP  | N-CA-C      | -6.83 | 102.68      | 111.02   |
| 65  | AL    | 170  | LEU  | CA-CB-CG    | 6.78  | 140.03      | 116.30   |
| 63  | AJ    | 81   | CYS  | CA-CB-SG    | 6.78  | 129.98      | 114.40   |
| 1   | A     | 1804 | A    | C5-C6-N6    | -6.54 | 104.07      | 123.70   |
| 67  | AN    | 5    | ARG  | CG-CD-NE    | 6.40  | 126.07      | 112.00   |
| 19  | U     | 136  | GLN  | CA-CB-CG    | 6.32  | 126.74      | 114.10   |
| 19  | U     | 118  | PRO  | N-CA-C      | -6.28 | 101.33      | 111.19   |
| 25  | AA    | 78   | C    | O3'-P-O5'   | 6.22  | 113.33      | 104.00   |
| 1   | A     | 2785 | C    | O3'-P-O5'   | 6.17  | 113.26      | 104.00   |
| 19  | U     | 116  | GLU  | N-CA-C      | -6.12 | 101.87      | 110.50   |
| 80  | A0    | 90   | ASP  | N-CA-C      | 6.12  | 117.95      | 111.28   |
| 89  | d     | 114  | LYS  | N-CA-C      | -5.82 | 105.02      | 111.36   |
| 63  | AJ    | 93   | CYS  | CA-CB-SG    | 5.79  | 127.72      | 114.40   |
| 89  | d     | 102  | LYS  | CA-CB-CG    | 5.69  | 125.48      | 114.10   |
| 19  | U     | 139  | SER  | N-CA-C      | -5.66 | 102.65      | 110.35   |
| 7   | I     | 63   | SER  | N-CA-C      | -5.56 | 106.34      | 113.01   |
| 87  | Ax    | 17   | A    | C2'-C3'-O3' | 5.40  | 117.60      | 109.50   |
| 1   | A     | 1804 | A    | N1-C6-N6    | 5.39  | 134.78      | 118.60   |
| 19  | U     | 116  | GLU  | CA-C-N      | -5.39 | 112.73      | 122.28   |
| 19  | U     | 116  | GLU  | C-N-CA      | -5.39 | 112.73      | 122.28   |
| 7   | I     | 69   | PRO  | N-CA-C      | 5.34  | 119.69      | 111.57   |
| 20  | V     | 34   | LYS  | N-CA-C      | -5.33 | 106.04      | 112.54   |
| 20  | V     | 25   | PRO  | N-CA-C      | 5.30  | 117.17      | 110.70   |
| 84  | A4    | 486  | TYR  | N-CA-CB     | 5.30  | 119.45      | 110.49   |
| 80  | A0    | 158  | GLU  | N-CA-C      | 5.28  | 116.69      | 107.49   |
| 80  | A0    | 87   | TRP  | N-CA-C      | 5.26  | 117.92      | 111.82   |
| 38  | 8     | 81   | GLU  | N-CA-C      | 5.24  | 121.97      | 110.80   |
| 60  | AG    | 65   | LYS  | CA-CB-CG    | 5.23  | 124.56      | 114.10   |
| 80  | A0    | 142  | VAL  | N-CA-C      | 5.23  | 112.32      | 107.56   |
| 89  | d     | 196  | GLN  | N-CA-C      | 5.18  | 117.52      | 108.76   |
| 74  | AU    | 58   | GLU  | N-CA-CB     | 5.18  | 118.31      | 110.28   |
| 89  | d     | 79   | ALA  | N-CA-C      | -5.17 | 105.61      | 112.34   |
| 80  | A0    | 89   | HIS  | N-CA-C      | 5.16  | 117.86      | 109.24   |
| 19  | U     | 142  | PRO  | N-CA-C      | -5.12 | 106.42      | 113.53   |
| 19  | U     | 148  | PRO  | N-CA-C      | -5.09 | 102.71      | 110.95   |
| 89  | d     | 249  | GLU  | N-CA-C      | 5.02  | 116.87      | 107.99   |
| 67  | AN    | 4    | VAL  | N-CA-C      | -5.01 | 96.96       | 111.00   |

There are no chirality outliers.

All (75) planarity outliers are listed below:

| Mol | Chain | Res | Type | Group     |
|-----|-------|-----|------|-----------|
| 36  | 6     | 47  | ARG  | Sidechain |
| 36  | 6     | 59  | ARG  | Sidechain |
| 37  | 7     | 156 | ARG  | Sidechain |
| 38  | 8     | 113 | ARG  | Sidechain |
| 38  | 8     | 114 | ARG  | Sidechain |
| 38  | 8     | 133 | ARG  | Sidechain |
| 38  | 8     | 137 | ARG  | Sidechain |
| 38  | 8     | 99  | ARG  | Sidechain |
| 80  | A0    | 99  | ARG  | Sidechain |
| 81  | A1    | 164 | ARG  | Sidechain |
| 81  | A1    | 260 | ARG  | Sidechain |
| 81  | A1    | 46  | ARG  | Sidechain |
| 84  | A4    | 270 | ARG  | Sidechain |
| 84  | A4    | 485 | ALA  | Mainchain |
| 84  | A4    | 80  | ARG  | Sidechain |
| 57  | AD    | 181 | ARG  | Sidechain |
| 60  | AG    | 136 | ARG  | Sidechain |
| 60  | AG    | 389 | ARG  | Sidechain |
| 61  | AH    | 75  | ARG  | Sidechain |
| 65  | AL    | 123 | ARG  | Sidechain |
| 65  | AL    | 147 | ARG  | Sidechain |
| 65  | AL    | 224 | ARG  | Sidechain |
| 65  | AL    | 225 | ARG  | Sidechain |
| 68  | AO    | 215 | ARG  | Sidechain |
| 69  | AP    | 141 | ARG  | Sidechain |
| 72  | AS    | 134 | ARG  | Sidechain |
| 72  | AS    | 98  | ARG  | Sidechain |
| 74  | AU    | 193 | ARG  | Sidechain |
| 74  | AU    | 41  | ARG  | Sidechain |
| 75  | AV    | 105 | ARG  | Sidechain |
| 75  | AV    | 392 | ARG  | Sidechain |
| 76  | AW    | 125 | ARG  | Sidechain |
| 76  | AW    | 85  | ARG  | Sidechain |
| 77  | AX    | 123 | ARG  | Sidechain |
| 79  | AZ    | 10  | ARG  | Sidechain |
| 79  | AZ    | 101 | ARG  | Sidechain |
| 79  | AZ    | 13  | ARG  | Sidechain |
| 79  | AZ    | 24  | ARG  | Sidechain |
| 5   | F     | 295 | ARG  | Sidechain |
| 6   | H     | 147 | ARG  | Sidechain |
| 6   | H     | 89  | ARG  | Sidechain |
| 8   | J     | 21  | ARG  | Sidechain |
| 8   | J     | 33  | PRO  | Peptide   |

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| Mol | Chain | Res | Type | Group     |
|-----|-------|-----|------|-----------|
| 12  | N     | 139 | ARG  | Sidechain |
| 12  | N     | 51  | ARG  | Sidechain |
| 14  | P     | 69  | ARG  | Sidechain |
| 15  | Q     | 67  | ARG  | Sidechain |
| 18  | T     | 157 | ARG  | Sidechain |
| 19  | U     | 134 | ARG  | Sidechain |
| 19  | U     | 143 | ARG  | Sidechain |
| 19  | U     | 3   | ARG  | Sidechain |
| 19  | U     | 54  | ARG  | Sidechain |
| 19  | U     | 71  | ARG  | Sidechain |
| 19  | U     | 80  | ARG  | Sidechain |
| 22  | X     | 112 | ARG  | Sidechain |
| 22  | X     | 36  | ARG  | Sidechain |
| 40  | a     | 95  | ARG  | Sidechain |
| 42  | c     | 311 | ARG  | Sidechain |
| 42  | c     | 47  | ARG  | Sidechain |
| 89  | d     | 219 | ARG  | Sidechain |
| 89  | d     | 260 | ARG  | Sidechain |
| 44  | f     | 155 | ARG  | Sidechain |
| 44  | f     | 183 | ARG  | Sidechain |
| 44  | f     | 201 | ARG  | Sidechain |
| 44  | f     | 78  | ARG  | Sidechain |
| 45  | g     | 56  | ARG  | Sidechain |
| 51  | m     | 125 | ARG  | Sidechain |
| 51  | m     | 94  | ARG  | Sidechain |
| 53  | p     | 179 | ARG  | Sidechain |
| 53  | p     | 83  | ARG  | Sidechain |
| 54  | q     | 28  | ARG  | Sidechain |
| 54  | q     | 33  | ARG  | Sidechain |
| 55  | r     | 134 | ARG  | Sidechain |
| 56  | s     | 43  | ARG  | Sidechain |
| 33  | z     | 223 | ARG  | Sidechain |

## 5.2 Too-close contacts ⓘ

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

| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 1   | A     | 33070 | 0        | 16790    | 17      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 2   | B     | 1524  | 0        | 778      | 6       | 0            |
| 3   | D     | 1859  | 0        | 1920     | 0       | 0            |
| 4   | E     | 2406  | 0        | 2415     | 1       | 0            |
| 5   | F     | 2031  | 0        | 2065     | 1       | 0            |
| 6   | H     | 1661  | 0        | 1734     | 2       | 0            |
| 7   | I     | 1695  | 0        | 1785     | 14      | 0            |
| 8   | J     | 1330  | 0        | 1407     | 5       | 0            |
| 9   | K     | 1455  | 0        | 1452     | 1       | 0            |
| 10  | L     | 890   | 0        | 941      | 0       | 0            |
| 11  | M     | 2327  | 0        | 2395     | 0       | 0            |
| 12  | N     | 1786  | 0        | 1817     | 1       | 0            |
| 13  | O     | 1259  | 0        | 1294     | 0       | 0            |
| 14  | P     | 1173  | 0        | 1165     | 1       | 0            |
| 15  | Q     | 1990  | 0        | 2031     | 0       | 0            |
| 16  | R     | 1154  | 0        | 1214     | 1       | 0            |
| 17  | S     | 1293  | 0        | 1365     | 9       | 0            |
| 18  | T     | 1369  | 0        | 1410     | 1       | 0            |
| 19  | U     | 1251  | 0        | 1232     | 34      | 0            |
| 20  | V     | 1754  | 0        | 1781     | 47      | 0            |
| 21  | W     | 880   | 0        | 904      | 0       | 0            |
| 22  | X     | 2044  | 0        | 2060     | 0       | 0            |
| 23  | Y     | 1556  | 0        | 1597     | 3       | 0            |
| 24  | Z     | 996   | 0        | 1044     | 1       | 0            |
| 25  | AA    | 20260 | 0        | 10285    | 21      | 0            |
| 26  | AB    | 1828  | 0        | 1815     | 0       | 0            |
| 27  | AC    | 1083  | 0        | 1088     | 0       | 0            |
| 28  | 0     | 898   | 0        | 916      | 0       | 0            |
| 29  | 1     | 464   | 0        | 511      | 0       | 0            |
| 30  | 2     | 377   | 0        | 406      | 0       | 0            |
| 31  | 3     | 832   | 0        | 883      | 0       | 0            |
| 32  | 4     | 342   | 0        | 361      | 2       | 0            |
| 33  | z     | 2027  | 0        | 2076     | 0       | 0            |
| 34  | t     | 354   | 0        | 377      | 0       | 0            |
| 34  | u     | 257   | 0        | 283      | 0       | 0            |
| 34  | v     | 257   | 0        | 283      | 3       | 0            |
| 34  | w     | 245   | 0        | 275      | 3       | 0            |
| 34  | x     | 245   | 0        | 275      | 1       | 0            |
| 34  | y     | 245   | 0        | 275      | 1       | 0            |
| 35  | 5     | 3200  | 0        | 3196     | 2       | 0            |
| 36  | 6     | 2948  | 0        | 2841     | 0       | 0            |
| 37  | 7     | 2390  | 0        | 2397     | 0       | 0            |
| 38  | 8     | 1219  | 0        | 1241     | 38      | 0            |

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| Mol | Chain | Non-H | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|-------|----------|----------|---------|--------------|
| 39  | g     | 997   | 0        | 987      | 0       | 0            |
| 40  | a     | 840   | 0        | 810      | 2       | 0            |
| 41  | b     | 1196  | 0        | 1195     | 0       | 0            |
| 42  | c     | 2299  | 0        | 2320     | 1       | 0            |
| 43  | e     | 1866  | 0        | 1868     | 15      | 0            |
| 44  | f     | 1252  | 0        | 1269     | 16      | 0            |
| 45  | g     | 1113  | 0        | 1097     | 0       | 0            |
| 46  | h     | 895   | 0        | 881      | 0       | 0            |
| 47  | i     | 828   | 0        | 857      | 0       | 0            |
| 48  | j     | 745   | 0        | 746      | 0       | 0            |
| 49  | k     | 774   | 0        | 784      | 0       | 0            |
| 50  | l     | 688   | 0        | 674      | 1       | 0            |
| 51  | m     | 791   | 0        | 796      | 6       | 0            |
| 52  | o     | 798   | 0        | 804      | 0       | 0            |
| 53  | p     | 1205  | 0        | 1223     | 0       | 0            |
| 54  | q     | 1398  | 0        | 1383     | 2       | 0            |
| 55  | r     | 1322  | 0        | 1348     | 3       | 0            |
| 56  | s     | 3155  | 0        | 3139     | 0       | 0            |
| 57  | AD    | 2700  | 0        | 2767     | 0       | 0            |
| 58  | AE    | 972   | 0        | 1001     | 1       | 0            |
| 59  | AF    | 1725  | 0        | 1769     | 1       | 0            |
| 60  | AG    | 2695  | 0        | 2694     | 3       | 0            |
| 61  | AH    | 1152  | 0        | 1183     | 2       | 0            |
| 62  | AI    | 1020  | 0        | 1053     | 6       | 0            |
| 63  | AJ    | 839   | 0        | 885      | 0       | 0            |
| 64  | AK    | 862   | 0        | 885      | 0       | 0            |
| 65  | AL    | 1453  | 0        | 1540     | 12      | 0            |
| 66  | AM    | 942   | 0        | 965      | 0       | 0            |
| 67  | AN    | 868   | 0        | 928      | 7       | 0            |
| 68  | AO    | 1592  | 0        | 1557     | 8       | 0            |
| 69  | AP    | 781   | 0        | 806      | 1       | 0            |
| 70  | AQ    | 744   | 0        | 758      | 2       | 0            |
| 71  | AR    | 2409  | 0        | 2428     | 1       | 0            |
| 72  | AS    | 1111  | 0        | 1115     | 3       | 0            |
| 73  | AT    | 1371  | 0        | 1393     | 0       | 0            |
| 74  | AU    | 1488  | 0        | 1499     | 7       | 0            |
| 75  | AV    | 2969  | 0        | 2961     | 12      | 0            |
| 76  | AW    | 789   | 0        | 802      | 0       | 0            |
| 77  | AX    | 2849  | 0        | 2843     | 2       | 0            |
| 78  | AY    | 1246  | 0        | 1197     | 0       | 0            |
| 79  | AZ    | 839   | 0        | 858      | 3       | 0            |
| 80  | A0    | 1787  | 0        | 1796     | 55      | 0            |

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| Mol | Chain | Non-H  | H(model) | H(added) | Clashes | Symm-Clashes |
|-----|-------|--------|----------|----------|---------|--------------|
| 81  | A1    | 2265   | 0        | 2294     | 2       | 0            |
| 82  | A2    | 935    | 0        | 971      | 1       | 0            |
| 83  | A3    | 625    | 0        | 699      | 0       | 0            |
| 84  | A4    | 4768   | 0        | 4766     | 3       | 0            |
| 85  | Az    | 701    | 0        | 351      | 0       | 0            |
| 86  | Aw    | 1435   | 0        | 726      | 21      | 0            |
| 87  | Ax    | 1499   | 0        | 762      | 34      | 0            |
| 88  | Av    | 190    | 0        | 56       | 20      | 0            |
| 89  | d     | 1969   | 0        | 1952     | 131     | 0            |
| 90  | Au    | 431    | 0        | 429      | 0       | 0            |
| 91  | 3     | 1      | 0        | 0        | 0       | 0            |
| 91  | 6     | 1      | 0        | 0        | 0       | 0            |
| 91  | A     | 28     | 0        | 0        | 0       | 0            |
| 91  | AA    | 20     | 0        | 0        | 0       | 0            |
| 91  | D     | 1      | 0        | 0        | 0       | 0            |
| 91  | M     | 1      | 0        | 0        | 0       | 0            |
| 91  | N     | 1      | 0        | 0        | 0       | 0            |
| 91  | o     | 1      | 0        | 0        | 0       | 0            |
| 92  | A     | 135    | 0        | 0        | 0       | 0            |
| 92  | A3    | 1      | 0        | 0        | 0       | 0            |
| 92  | AA    | 53     | 0        | 0        | 0       | 0            |
| 92  | AB    | 1      | 0        | 0        | 0       | 0            |
| 92  | AX    | 1      | 0        | 0        | 0       | 0            |
| 92  | D     | 2      | 0        | 0        | 0       | 0            |
| 92  | E     | 1      | 0        | 0        | 0       | 0            |
| 92  | O     | 1      | 0        | 0        | 0       | 0            |
| 92  | g     | 1      | 0        | 0        | 0       | 0            |
| 93  | B     | 7      | 0        | 8        | 6       | 0            |
| 94  | AE    | 4      | 0        | 0        | 0       | 0            |
| 94  | AT    | 4      | 0        | 0        | 0       | 0            |
| 94  | I     | 4      | 0        | 0        | 1       | 0            |
| 95  | AA    | 44     | 0        | 26       | 1       | 0            |
| 96  | 0     | 1      | 0        | 0        | 0       | 0            |
| 96  | 4     | 1      | 0        | 0        | 0       | 0            |
| 96  | AO    | 1      | 0        | 0        | 0       | 0            |
| 97  | AX    | 31     | 0        | 12       | 1       | 0            |
| 98  | AX    | 28     | 0        | 12       | 0       | 0            |
| All | All   | 180782 | 0        | 153308   | 466     | 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 1.

All (466) 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) |
|--------------------|-------------------|--------------------------|-------------------|
| 89:d:80:CYS:SG     | 89:d:166:GLU:HB2  | 1.49                     | 1.48              |
| 80:A0:81:THR:CG2   | 80:A0:150:PHE:CZ  | 2.09                     | 1.34              |
| 80:A0:142:VAL:HG22 | 80:A0:150:PHE:CE1 | 1.62                     | 1.33              |
| 80:A0:81:THR:HG22  | 80:A0:150:PHE:CZ  | 1.68                     | 1.27              |
| 19:U:133:GLU:O     | 19:U:136:GLN:HG3  | 1.35                     | 1.22              |
| 32:4:76:CYS:SG     | 32:4:92:CYS:SG    | 2.38                     | 1.21              |
| 89:d:80:CYS:SG     | 89:d:166:GLU:CB   | 2.29                     | 1.21              |
| 80:A0:142:VAL:HG22 | 80:A0:150:PHE:CD1 | 1.77                     | 1.19              |
| 88:Av:43:UNK:N     | 89:d:78:LEU:HD11  | 1.56                     | 1.18              |
| 88:Av:42:UNK:CB    | 89:d:78:LEU:HD21  | 1.80                     | 1.10              |
| 38:8:100:GLU:HA    | 43:e:83:LEU:HD22  | 1.33                     | 1.08              |
| 88:Av:43:UNK:N     | 89:d:78:LEU:CD1   | 2.16                     | 1.08              |
| 80:A0:81:THR:CG2   | 80:A0:150:PHE:HZ  | 1.56                     | 1.07              |
| 93:B:101:VAL:HG23  | 43:e:166:GLY:N    | 1.73                     | 1.04              |
| 89:d:85:PHE:HB3    | 89:d:198:ARG:HB3  | 1.40                     | 1.04              |
| 80:A0:81:THR:HG21  | 80:A0:150:PHE:CZ  | 1.96                     | 0.99              |
| 80:A0:142:VAL:CG2  | 80:A0:150:PHE:CE1 | 2.47                     | 0.96              |
| 74:AU:58:GLU:HG3   | 80:A0:158:GLU:HG2 | 1.45                     | 0.96              |
| 86:Aw:9:A:H1'      | 86:Aw:45:A:H2'    | 1.46                     | 0.94              |
| 87:Ax:46:A:H2'     | 87:Ax:48:U:H4'    | 1.51                     | 0.92              |
| 80:A0:81:THR:HG22  | 80:A0:150:PHE:CE1 | 2.05                     | 0.91              |
| 87:Ax:16:C:H2'     | 87:Ax:17:A:H2'    | 1.54                     | 0.88              |
| 89:d:80:CYS:SG     | 89:d:166:GLU:C    | 2.56                     | 0.88              |
| 89:d:212:ILE:CD1   | 89:d:259:TRP:CH2  | 2.57                     | 0.87              |
| 89:d:80:CYS:HG     | 89:d:166:GLU:HB2  | 1.36                     | 0.85              |
| 19:U:115:ASP:OD1   | 23:Y:75:GLY:HA2   | 1.76                     | 0.84              |
| 38:8:99:ARG:HA     | 43:e:89:LEU:HD11  | 1.59                     | 0.84              |
| 89:d:212:ILE:HD11  | 89:d:259:TRP:CH2  | 2.13                     | 0.84              |
| 89:d:212:ILE:HD12  | 89:d:259:TRP:CZ3  | 2.13                     | 0.83              |
| 88:Av:42:UNK:CB    | 89:d:78:LEU:CD2   | 2.56                     | 0.83              |
| 87:Ax:22:A:H2'     | 87:Ax:23:A:C8     | 2.14                     | 0.83              |
| 88:Av:42:UNK:C     | 89:d:78:LEU:HD11  | 2.08                     | 0.83              |
| 80:A0:142:VAL:HG22 | 80:A0:150:PHE:CZ  | 2.13                     | 0.82              |
| 87:Ax:22:A:H2'     | 87:Ax:23:A:H8     | 1.45                     | 0.81              |
| 80:A0:81:THR:CB    | 80:A0:150:PHE:HZ  | 1.91                     | 0.81              |
| 38:8:80:GLN:HA     | 44:f:201:ARG:HD2  | 1.62                     | 0.81              |
| 93:B:101:VAL:HG23  | 43:e:166:GLY:H    | 1.42                     | 0.81              |
| 38:8:102:PRO:HD2   | 43:e:84:TYR:CE2   | 2.16                     | 0.80              |
| 93:B:101:VAL:CG2   | 43:e:166:GLY:H    | 1.95                     | 0.80              |
| 80:A0:81:THR:CG2   | 80:A0:150:PHE:CE1 | 2.65                     | 0.79              |
| 88:Av:40:UNK:HA    | 89:d:78:LEU:HD12  | 1.65                     | 0.79              |
| 88:Av:42:UNK:N     | 89:d:78:LEU:HD11  | 1.96                     | 0.79              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 1:A:3112:A:N7     | 1:A:3200:U:O2     | 2.16                     | 0.79              |
| 89:d:80:CYS:SG    | 89:d:167:HIS:N    | 2.55                     | 0.79              |
| 80:A0:142:VAL:CG2 | 80:A0:150:PHE:CZ  | 2.66                     | 0.78              |
| 38:8:80:GLN:HG3   | 44:f:198:PHE:HB3  | 1.65                     | 0.78              |
| 88:Av:42:UNK:CA   | 89:d:78:LEU:HD11  | 2.14                     | 0.77              |
| 80:A0:81:THR:CB   | 80:A0:150:PHE:CZ  | 2.67                     | 0.76              |
| 89:d:225:TYR:HA   | 89:d:232:MET:H    | 1.49                     | 0.76              |
| 19:U:141:ASP:HB2  | 19:U:144:ARG:HG2  | 1.65                     | 0.76              |
| 88:Av:40:UNK:CA   | 89:d:78:LEU:HD12  | 2.15                     | 0.76              |
| 75:AV:251:TRP:CZ2 | 80:A0:150:PHE:CD1 | 2.74                     | 0.76              |
| 7:I:60:ILE:HB     | 7:I:66:PRO:HD3    | 1.69                     | 0.75              |
| 17:S:145:GLY:HA2  | 40:a:57:THR:HA    | 1.68                     | 0.75              |
| 80:A0:81:THR:HG22 | 80:A0:150:PHE:HZ  | 1.14                     | 0.74              |
| 20:V:19:TYR:HE2   | 20:V:35:ASN:HB3   | 1.51                     | 0.74              |
| 89:d:212:ILE:CD1  | 89:d:259:TRP:CZ3  | 2.70                     | 0.74              |
| 89:d:77:HIS:CD2   | 89:d:205:GLN:H    | 2.07                     | 0.73              |
| 7:I:62:PRO:HA     | 7:I:66:PRO:HB2    | 1.70                     | 0.73              |
| 19:U:136:GLN:NE2  | 89:d:82:ALA:HB1   | 2.02                     | 0.73              |
| 93:B:101:VAL:CG2  | 43:e:166:GLY:N    | 2.51                     | 0.72              |
| 89:d:80:CYS:SG    | 89:d:166:GLU:CA   | 2.77                     | 0.72              |
| 89:d:91:PRO:HD2   | 89:d:269:TRP:HE1  | 1.55                     | 0.72              |
| 80:A0:81:THR:HB   | 80:A0:150:PHE:CZ  | 2.26                     | 0.70              |
| 89:d:88:TYR:HA    | 89:d:196:GLN:HG3  | 1.74                     | 0.70              |
| 89:d:76:ILE:C     | 89:d:78:LEU:N     | 2.48                     | 0.69              |
| 38:8:100:GLU:CA   | 43:e:83:LEU:HD22  | 2.19                     | 0.69              |
| 8:J:22:ALA:HB2    | 8:J:35:LEU:HD21   | 1.75                     | 0.69              |
| 75:AV:251:TRP:CH2 | 80:A0:150:PHE:CD1 | 2.81                     | 0.69              |
| 89:d:118:SER:HB2  | 89:d:197:VAL:H    | 1.59                     | 0.68              |
| 87:Ax:44:A:H3'    | 87:Ax:45:G:H8     | 1.59                     | 0.68              |
| 7:I:61:HIS:O      | 7:I:66:PRO:HD2    | 1.94                     | 0.68              |
| 38:8:72:ILE:HB    | 44:f:211:LEU:HD21 | 1.73                     | 0.67              |
| 38:8:187:PRO:HB2  | 51:m:78:PRO:HA    | 1.75                     | 0.67              |
| 38:8:63:GLU:HG2   | 87:Ax:10:G:H4'    | 1.77                     | 0.66              |
| 86:Aw:8:U:H2'     | 86:Aw:13:U:H3     | 1.59                     | 0.66              |
| 7:I:65:LEU:HB3    | 7:I:66:PRO:HD3    | 1.78                     | 0.66              |
| 20:V:17:PRO:HB3   | 20:V:32:LYS:HZ1   | 1.59                     | 0.66              |
| 89:d:76:ILE:C     | 89:d:78:LEU:H     | 2.03                     | 0.66              |
| 87:Ax:8:U:O2      | 87:Ax:14:A:N7     | 2.29                     | 0.66              |
| 38:8:99:ARG:CA    | 43:e:89:LEU:HD11  | 2.26                     | 0.65              |
| 20:V:19:TYR:CE2   | 20:V:35:ASN:HB3   | 2.32                     | 0.65              |
| 38:8:72:ILE:CB    | 44:f:211:LEU:HD21 | 2.27                     | 0.65              |

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| Atom-1             | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|-------------------|--------------------------|-------------------|
| 89:d:209:TYR:CD1   | 89:d:251:GLN:HG3  | 2.32                     | 0.65              |
| 88:Av:40:UNK:C     | 89:d:78:LEU:HD12  | 2.27                     | 0.64              |
| 1:A:1804:A:H61     | 20:V:27:GLY:CA    | 2.09                     | 0.64              |
| 19:U:136:GLN:HE22  | 89:d:82:ALA:HB1   | 1.62                     | 0.64              |
| 89:d:208:VAL:HB    | 89:d:252:LEU:HD12 | 1.79                     | 0.64              |
| 20:V:21:TYR:CD1    | 20:V:83:ARG:HD2   | 2.33                     | 0.64              |
| 1:A:2935:A:OP1     | 1:A:2986:C:OP1    | 2.15                     | 0.63              |
| 25:AA:330:A:H1'    | 62:AI:182:PRO:HB3 | 1.81                     | 0.63              |
| 19:U:1:ACE:H3      | 19:U:19:VAL:HG21  | 1.80                     | 0.63              |
| 89:d:90:PRO:HB2    | 89:d:268:PRO:HD3  | 1.80                     | 0.62              |
| 2:B:39:PSU:H2'     | 2:B:40:U:C6       | 2.34                     | 0.62              |
| 20:V:26:PRO:HG3    | 89:d:74:ARG:N     | 2.15                     | 0.62              |
| 20:V:17:PRO:HB3    | 20:V:32:LYS:NZ    | 2.15                     | 0.62              |
| 80:A0:88:GLN:O     | 80:A0:155:PRO:HA  | 2.00                     | 0.62              |
| 19:U:146:GLY:O     | 19:U:147:VAL:C    | 2.43                     | 0.62              |
| 20:V:110:PRO:HD2   | 89:d:76:ILE:HG21  | 1.82                     | 0.62              |
| 88:Av:47:UNK:O     | 89:d:69:PRO:HB2   | 2.01                     | 0.61              |
| 80:A0:146:GLU:HB3  | 80:A0:149:ALA:HB3 | 1.83                     | 0.61              |
| 75:AV:251:TRP:CH2  | 80:A0:150:PHE:HD1 | 2.18                     | 0.60              |
| 86:Aw:56:A:H2'     | 86:Aw:61:U:C5     | 2.36                     | 0.60              |
| 89:d:77:HIS:HD2    | 89:d:205:GLN:H    | 1.50                     | 0.60              |
| 68:AO:215:ARG:HH11 | 80:A0:155:PRO:HD2 | 1.66                     | 0.59              |
| 1:A:3112:A:N7      | 1:A:3200:U:C2     | 2.70                     | 0.59              |
| 19:U:115:ASP:HA    | 23:Y:75:GLY:HA3   | 1.83                     | 0.59              |
| 89:d:79:ALA:HA     | 89:d:203:MET:HE1  | 1.82                     | 0.59              |
| 38:8:190:GLY:HA3   | 44:f:135:LEU:O    | 2.02                     | 0.59              |
| 80:A0:85:TRP:O     | 80:A0:86:LEU:C    | 2.45                     | 0.59              |
| 86:Aw:8:U:H2'      | 86:Aw:13:U:N3     | 2.17                     | 0.59              |
| 19:U:111:PHE:CD2   | 19:U:115:ASP:OD1  | 2.56                     | 0.59              |
| 74:AU:58:GLU:CG    | 80:A0:158:GLU:HG2 | 2.26                     | 0.59              |
| 75:AV:251:TRP:HZ2  | 80:A0:150:PHE:CD1 | 2.21                     | 0.59              |
| 87:Ax:44:A:H3'     | 87:Ax:45:G:C8     | 2.37                     | 0.59              |
| 20:V:25:PRO:HG2    | 89:d:74:ARG:CB    | 2.33                     | 0.58              |
| 38:8:62:GLN:HA     | 38:8:65:LYS:HE2   | 1.85                     | 0.58              |
| 87:Ax:16:C:C2'     | 87:Ax:17:A:H2'    | 2.28                     | 0.58              |
| 87:Ax:46:A:C2'     | 87:Ax:48:U:H4'    | 2.30                     | 0.58              |
| 8:J:30:MET:HB3     | 8:J:31:PRO:HD2    | 1.85                     | 0.58              |
| 7:I:62:PRO:O       | 7:I:68:PRO:HD3    | 2.03                     | 0.58              |
| 80:A0:89:HIS:O     | 80:A0:153:PHE:HB3 | 2.03                     | 0.58              |
| 35:5:104:CYS:O     | 35:5:268:CYS:HB3  | 2.03                     | 0.58              |
| 87:Ax:51:A:H3'     | 87:Ax:52:G:C8     | 2.39                     | 0.58              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 62:AI:188:PRO:HD2  | 70:AQ:45:TYR:CD1   | 2.38                     | 0.58              |
| 89:d:86:ASP:HB2    | 89:d:198:ARG:HB2   | 1.86                     | 0.58              |
| 89:d:91:PRO:HB2    | 89:d:94:ASP:HB2    | 1.85                     | 0.57              |
| 2:B:10:2MG:H2'     | 2:B:11:C:C6        | 2.40                     | 0.57              |
| 89:d:91:PRO:O      | 89:d:269:TRP:HD1   | 1.86                     | 0.57              |
| 75:AV:250:ILE:HD11 | 80:A0:150:PHE:HA   | 1.85                     | 0.57              |
| 89:d:93:GLY:H      | 89:d:269:TRP:CG    | 2.23                     | 0.57              |
| 12:N:55:ARG:HH21   | 86:Aw:63:A:H4'     | 1.68                     | 0.57              |
| 74:AU:57:MET:CE    | 80:A0:158:GLU:HG3  | 2.34                     | 0.57              |
| 20:V:3:LEU:O       | 20:V:6:LEU:HB3     | 2.05                     | 0.57              |
| 89:d:176:ILE:HA    | 89:d:179:LYS:HB2   | 1.85                     | 0.57              |
| 25:AA:111:U:O2     | 25:AA:499:C:O2     | 2.23                     | 0.56              |
| 38:8:104:VAL:HG12  | 38:8:105:GLU:H     | 1.70                     | 0.56              |
| 8:J:22:ALA:HB3     | 8:J:35:LEU:HD11    | 1.88                     | 0.56              |
| 20:V:109:ILE:HG21  | 89:d:78:LEU:HD23   | 1.86                     | 0.56              |
| 89:d:76:ILE:HG23   | 89:d:78:LEU:HA     | 1.87                     | 0.56              |
| 25:AA:841:5MC:H2'  | 25:AA:842:G:C8     | 2.41                     | 0.56              |
| 75:AV:250:ILE:HG12 | 80:A0:149:ALA:CB   | 2.36                     | 0.56              |
| 80:A0:90:ASP:CG    | 80:A0:155:PRO:HD3  | 2.31                     | 0.56              |
| 38:8:80:GLN:HA     | 44:f:201:ARG:CD    | 2.33                     | 0.56              |
| 68:AO:215:ARG:NH1  | 80:A0:155:PRO:HD2  | 2.21                     | 0.56              |
| 89:d:250:LYS:HB2   | 89:d:259:TRP:CD2   | 2.41                     | 0.56              |
| 19:U:111:PHE:HD2   | 19:U:115:ASP:CG    | 2.14                     | 0.56              |
| 38:8:193:ASN:HB3   | 44:f:133:GLU:HB2   | 1.88                     | 0.55              |
| 86:Aw:49:U:OP1     | 86:Aw:49:U:H3'     | 2.07                     | 0.55              |
| 17:S:133:VAL:O     | 17:S:149:LEU:HB2   | 2.05                     | 0.55              |
| 2:B:39:PSU:H2'     | 2:B:40:U:H6        | 1.71                     | 0.55              |
| 74:AU:57:MET:HE3   | 80:A0:158:GLU:HG3  | 1.89                     | 0.55              |
| 88:Av:40:UNK:C     | 89:d:78:LEU:CD1    | 2.84                     | 0.55              |
| 88:Av:43:UNK:N     | 89:d:78:LEU:CG     | 2.69                     | 0.55              |
| 89:d:226:ASP:N     | 89:d:230:ARG:O     | 2.31                     | 0.55              |
| 77:AX:389:SER:HB2  | 97:AX:501:ATP:H5'1 | 1.88                     | 0.55              |
| 86:Aw:14:A:H3'     | 86:Aw:15:A:H8      | 1.71                     | 0.55              |
| 8:J:35:LEU:O       | 8:J:39:LEU:N       | 2.28                     | 0.55              |
| 20:V:17:PRO:HG2    | 20:V:20:ARG:O      | 2.07                     | 0.55              |
| 1:A:3218:A:OP2     | 4:E:212:GLY:O      | 2.25                     | 0.55              |
| 72:AS:122:GLY:HA3  | 72:AS:134:ARG:HG3  | 1.88                     | 0.55              |
| 19:U:112:PRO:C     | 19:U:114:LYS:N     | 2.63                     | 0.55              |
| 43:e:114:ILE:HD12  | 77:AX:234:ARG:HB3  | 1.88                     | 0.55              |
| 20:V:25:PRO:CD     | 20:V:26:PRO:HD3    | 2.37                     | 0.55              |
| 86:Aw:54:U:H2'     | 86:Aw:55:A:O4'     | 2.07                     | 0.55              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 38:8:80:GLN:CG     | 44:f:198:PHE:HB3   | 2.35                     | 0.54              |
| 20:V:16:PRO:HG2    | 20:V:21:TYR:HD2    | 1.71                     | 0.54              |
| 38:8:63:GLU:CG     | 87:Ax:10:G:H4'     | 2.37                     | 0.54              |
| 38:8:99:ARG:HG3    | 43:e:84:TYR:O      | 2.08                     | 0.54              |
| 38:8:188:PRO:O     | 51:m:78:PRO:HB3    | 2.07                     | 0.54              |
| 80:A0:142:VAL:HG22 | 80:A0:150:PHE:CG   | 2.39                     | 0.54              |
| 89:d:78:LEU:C      | 89:d:80:CYS:N      | 2.63                     | 0.54              |
| 1:A:3089:A:H3'     | 1:A:3090:G:C5'     | 2.38                     | 0.54              |
| 89:d:226:ASP:OD1   | 89:d:230:ARG:N     | 2.41                     | 0.54              |
| 19:U:66:ALA:HB2    | 19:U:100:ALA:HB2   | 1.90                     | 0.54              |
| 65:AL:120:GLU:HB3  | 65:AL:174:ASN:HB3  | 1.90                     | 0.54              |
| 2:B:39:PSU:H4'     | 14:P:151:TRP:CG    | 2.43                     | 0.53              |
| 80:A0:81:THR:HB    | 80:A0:150:PHE:HZ   | 1.64                     | 0.53              |
| 89:d:76:ILE:HG23   | 89:d:78:LEU:CA     | 2.39                     | 0.53              |
| 38:8:99:ARG:O      | 43:e:83:LEU:HB3    | 2.08                     | 0.53              |
| 8:J:30:MET:HB2     | 8:J:33:PRO:HD2     | 1.90                     | 0.53              |
| 20:V:109:ILE:HB    | 89:d:76:ILE:HG21   | 1.89                     | 0.53              |
| 88:Av:56:UNK:O     | 88:Av:57:UNK:C     | 2.56                     | 0.53              |
| 20:V:9:LEU:O       | 20:V:11:SER:N      | 2.42                     | 0.53              |
| 58:AE:104:GLU:OE2  | 69:AP:68:CYS:CB    | 2.57                     | 0.53              |
| 89:d:124:ARG:HH21  | 89:d:208:VAL:CG1   | 2.21                     | 0.53              |
| 80:A0:86:LEU:HD12  | 80:A0:140:ARG:HH11 | 1.74                     | 0.53              |
| 19:U:115:ASP:CG    | 23:Y:75:GLY:HA2    | 2.33                     | 0.52              |
| 20:V:26:PRO:HG3    | 89:d:74:ARG:HB3    | 1.91                     | 0.52              |
| 86:Aw:62:C:H2'     | 86:Aw:63:A:C8      | 2.44                     | 0.52              |
| 89:d:92:GLU:HA     | 89:d:269:TRP:CD1   | 2.44                     | 0.52              |
| 89:d:190:GLU:HG2   | 89:d:217:HIS:HB3   | 1.92                     | 0.52              |
| 17:S:146:LYS:HB2   | 17:S:147:PRO:HD3   | 1.90                     | 0.52              |
| 75:AV:250:ILE:HG12 | 80:A0:149:ALA:HB1  | 1.92                     | 0.52              |
| 20:V:26:PRO:HG3    | 89:d:74:ARG:H      | 1.74                     | 0.52              |
| 25:AA:329:A:O2'    | 62:AI:181:ILE:O    | 2.28                     | 0.51              |
| 65:AL:120:GLU:CB   | 65:AL:174:ASN:HB3  | 2.40                     | 0.51              |
| 87:Ax:51:A:H3'     | 87:Ax:52:G:H8      | 1.75                     | 0.51              |
| 89:d:166:GLU:O     | 89:d:170:PRO:HD2   | 2.10                     | 0.51              |
| 86:Aw:43:U:O2'     | 86:Aw:44:C:H5'     | 2.10                     | 0.51              |
| 87:Ax:10:G:H2'     | 87:Ax:10:G:N3      | 2.25                     | 0.51              |
| 7:I:60:ILE:HB      | 7:I:65:LEU:HB3     | 1.91                     | 0.51              |
| 88:Av:40:UNK:CA    | 89:d:78:LEU:CD1    | 2.86                     | 0.51              |
| 89:d:91:PRO:O      | 89:d:269:TRP:CD1   | 2.63                     | 0.51              |
| 20:V:30:ALA:HB1    | 20:V:34:LYS:HB3    | 1.92                     | 0.51              |
| 86:Aw:12:U:H2'     | 86:Aw:13:U:H5'     | 1.93                     | 0.51              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 86:Aw:14:A:H3'     | 86:Aw:15:A:C8      | 2.44                     | 0.51              |
| 38:8:78:ALA:CB     | 44:f:201:ARG:HH12  | 2.23                     | 0.51              |
| 32:4:76:CYS:SG     | 32:4:79:CYS:SG     | 3.09                     | 0.51              |
| 17:S:134:LEU:O     | 17:S:144:LEU:HD12  | 2.09                     | 0.51              |
| 86:Aw:22:A:H2'     | 86:Aw:23:A:O4'     | 2.11                     | 0.51              |
| 86:Aw:22:A:OP2     | 86:Aw:46:A:N6      | 2.44                     | 0.51              |
| 87:Ax:9:A:N3       | 87:Ax:45:G:H2'     | 2.26                     | 0.51              |
| 80:A0:90:ASP:OD1   | 80:A0:155:PRO:HD3  | 2.11                     | 0.50              |
| 89:d:225:TYR:HA    | 89:d:231:LEU:HA    | 1.93                     | 0.50              |
| 25:AA:571:A:OP1    | 25:AA:682:U:OP1    | 2.29                     | 0.50              |
| 80:A0:86:LEU:HA    | 80:A0:152:ALA:O    | 2.10                     | 0.50              |
| 19:U:144:ARG:HB3   | 19:U:147:VAL:HG23  | 1.92                     | 0.50              |
| 38:8:73:ARG:HH12   | 38:8:74:LYS:HE2    | 1.77                     | 0.50              |
| 87:Ax:10:G:N7      | 87:Ax:45:G:H1'     | 2.26                     | 0.50              |
| 68:AO:216:LEU:HD11 | 80:A0:157:PRO:HG3  | 1.93                     | 0.50              |
| 89:d:212:ILE:HG13  | 89:d:259:TRP:CZ3   | 2.47                     | 0.50              |
| 20:V:25:PRO:CG     | 20:V:26:PRO:HD3    | 2.42                     | 0.50              |
| 20:V:108:MET:H     | 89:d:170:PRO:HG3   | 1.75                     | 0.50              |
| 74:AU:58:GLU:HB3   | 80:A0:160:SER:OG   | 2.11                     | 0.50              |
| 89:d:219:ARG:HG2   | 89:d:239:PRO:HB2   | 1.94                     | 0.50              |
| 19:U:120:GLY:O     | 19:U:121:SER:C     | 2.50                     | 0.50              |
| 87:Ax:7:A:H3'      | 87:Ax:8:U:H5''     | 1.93                     | 0.50              |
| 89:d:76:ILE:HG23   | 89:d:78:LEU:H      | 1.77                     | 0.49              |
| 89:d:226:ASP:HA    | 89:d:232:MET:HE3   | 1.94                     | 0.49              |
| 25:AA:78:C:H2'     | 67:AN:5:ARG:HG3    | 1.92                     | 0.49              |
| 86:Aw:63:A:H2'     | 86:Aw:64:U:C6      | 2.47                     | 0.49              |
| 87:Ax:17:A:O2'     | 87:Ax:22:A:OP2     | 2.31                     | 0.49              |
| 25:AA:79:C:C6      | 67:AN:5:ARG:HD2    | 2.48                     | 0.49              |
| 86:Aw:21:A:N6      | 86:Aw:46:A:O2'     | 2.46                     | 0.49              |
| 25:AA:135:A:OP1    | 95:AA:1002:NAD:H2D | 2.12                     | 0.49              |
| 25:AA:915:G:H1'    | 25:AA:936:MA6:H2   | 1.95                     | 0.49              |
| 65:AL:120:GLU:HG3  | 65:AL:170:LEU:HD12 | 1.95                     | 0.49              |
| 38:8:73:ARG:HG3    | 38:8:74:LYS:N      | 2.27                     | 0.49              |
| 89:d:76:ILE:HG13   | 89:d:79:ALA:H      | 1.78                     | 0.49              |
| 19:U:133:GLU:O     | 19:U:136:GLN:CG    | 2.30                     | 0.49              |
| 25:AA:936:MA6:H102 | 25:AA:937:MA6:H103 | 1.95                     | 0.48              |
| 80:A0:90:ASP:HA    | 80:A0:153:PHE:HB3  | 1.95                     | 0.48              |
| 87:Ax:17:A:O2'     | 87:Ax:22:A:O4'     | 2.25                     | 0.48              |
| 20:V:32:LYS:HA     | 20:V:35:ASN:O      | 2.12                     | 0.48              |
| 17:S:131:GLU:HB3   | 17:S:151:LYS:HE2   | 1.94                     | 0.48              |
| 25:AA:840:C:C2     | 25:AA:841:5MC:HM52 | 2.49                     | 0.48              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 62:AI:182:PRO:HB2  | 62:AI:185:GLY:HA3  | 1.95                     | 0.48              |
| 89:d:102:LYS:NZ    | 89:d:108:ARG:HD3   | 2.28                     | 0.48              |
| 20:V:31:ASP:O      | 20:V:35:ASN:HB2    | 2.14                     | 0.48              |
| 72:AS:118:PHE:CG   | 72:AS:134:ARG:HB3  | 2.49                     | 0.48              |
| 88:Av:42:UNK:N     | 89:d:78:LEU:CD1    | 2.74                     | 0.48              |
| 89:d:77:HIS:CD2    | 89:d:205:GLN:N     | 2.80                     | 0.48              |
| 1:A:1804:A:H61     | 20:V:27:GLY:HA3    | 1.77                     | 0.48              |
| 20:V:26:PRO:O      | 89:d:71:LYS:HB3    | 2.14                     | 0.48              |
| 44:f:125:TYR:CD1   | 44:f:197:ARG:HD2   | 2.48                     | 0.48              |
| 86:Aw:62:C:H2'     | 86:Aw:63:A:H8      | 1.78                     | 0.48              |
| 89:d:122:ILE:HD11  | 89:d:197:VAL:HG21  | 1.94                     | 0.48              |
| 7:I:60:ILE:O       | 7:I:66:PRO:HG2     | 2.13                     | 0.48              |
| 25:AA:77:C:H2'     | 25:AA:78:C:C6      | 2.49                     | 0.48              |
| 80:A0:81:THR:HG21  | 80:A0:150:PHE:CE1  | 2.44                     | 0.48              |
| 89:d:219:ARG:HA    | 89:d:241:ASP:HA    | 1.95                     | 0.48              |
| 5:F:293:PHE:HB3    | 5:F:294:PRO:HD3    | 1.96                     | 0.48              |
| 89:d:76:ILE:O      | 89:d:78:LEU:N      | 2.47                     | 0.48              |
| 89:d:183:TRP:HD1   | 89:d:222:LEU:HB3   | 1.78                     | 0.48              |
| 1:A:2200:A:H5''    | 50:l:134:LYS:HD3   | 1.96                     | 0.47              |
| 17:S:149:LEU:HD13  | 17:S:154:VAL:HG11  | 1.96                     | 0.47              |
| 38:8:190:GLY:N     | 51:m:78:PRO:HB2    | 2.29                     | 0.47              |
| 87:Ax:15:A:H61     | 87:Ax:48:U:C2'     | 2.27                     | 0.47              |
| 25:AA:78:C:N3      | 67:AN:4:VAL:HB     | 2.29                     | 0.47              |
| 60:AG:65:LYS:HD3   | 60:AG:66:ARG:H     | 1.79                     | 0.47              |
| 89:d:76:ILE:HG23   | 89:d:78:LEU:N      | 2.28                     | 0.47              |
| 65:AL:118:ASN:HD22 | 65:AL:181:ILE:HG13 | 1.79                     | 0.47              |
| 80:A0:85:TRP:HB3   | 80:A0:153:PHE:HE1  | 1.79                     | 0.47              |
| 86:Aw:44:C:H2'     | 86:Aw:45:A:C8      | 2.49                     | 0.47              |
| 16:R:93:CYS:O      | 17:S:146:LYS:HB3   | 2.14                     | 0.47              |
| 87:Ax:50:G:N2      | 87:Ax:51:A:H62     | 2.12                     | 0.47              |
| 68:AO:212:GLU:HA   | 68:AO:215:ARG:HG2  | 1.95                     | 0.47              |
| 80:A0:86:LEU:CD1   | 80:A0:140:ARG:HH11 | 2.28                     | 0.47              |
| 89:d:88:TYR:CA     | 89:d:196:GLN:HG3   | 2.42                     | 0.47              |
| 19:U:147:VAL:HG22  | 89:d:276:ILE:CG2   | 2.45                     | 0.47              |
| 89:d:80:CYS:HB3    | 89:d:167:HIS:HA    | 1.96                     | 0.47              |
| 1:A:1723:A:N7      | 1:A:1725:C:OP1     | 2.48                     | 0.47              |
| 89:d:108:ARG:O     | 89:d:111:ARG:HG2   | 2.15                     | 0.47              |
| 89:d:77:HIS:HB3    | 89:d:203:MET:CB    | 2.45                     | 0.47              |
| 20:V:16:PRO:HG2    | 20:V:21:TYR:CD2    | 2.49                     | 0.47              |
| 20:V:19:TYR:OH     | 20:V:32:LYS:HD3    | 2.15                     | 0.47              |
| 75:AV:250:ILE:HG23 | 75:AV:252:LYS:H    | 1.80                     | 0.47              |

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| Atom-1            | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|-------------------|-------------------|--------------------------|-------------------|
| 80:A0:79:LEU:HD12 | 80:A0:147:GLU:OE1 | 2.15                     | 0.47              |
| 19:U:3:ARG:HG3    | 19:U:47:GLU:CD    | 2.40                     | 0.47              |
| 20:V:23:MET:SD    | 20:V:114:PRO:HD3  | 2.54                     | 0.47              |
| 59:AF:234:ARG:HB2 | 82:A2:53:MET:HE1  | 1.97                     | 0.47              |
| 68:AO:202:TRP:CD1 | 80:A0:161:LEU:HB2 | 2.51                     | 0.46              |
| 84:A4:485:ALA:O   | 84:A4:486:TYR:CD1 | 2.68                     | 0.46              |
| 89:d:76:ILE:HG13  | 89:d:79:ALA:HB2   | 1.97                     | 0.46              |
| 9:K:2:SER:HB3     | 9:K:4:PHE:CD2     | 2.50                     | 0.46              |
| 25:AA:79:C:O4'    | 67:AN:5:ARG:HD2   | 2.15                     | 0.46              |
| 65:AL:175:TYR:HB2 | 67:AN:89:GLY:HA3  | 1.98                     | 0.46              |
| 20:V:36:PRO:HB2   | 20:V:39:ILE:HG23  | 1.98                     | 0.46              |
| 87:Ax:50:G:N3     | 87:Ax:50:G:H2'    | 2.31                     | 0.46              |
| 7:I:61:HIS:HB3    | 7:I:64:CYS:SG     | 2.55                     | 0.46              |
| 17:S:94:ARG:HA    | 42:c:313:PRO:HD3  | 1.98                     | 0.46              |
| 38:8:199:TYR:HB2  | 44:f:199:LYS:HE3  | 1.98                     | 0.46              |
| 89:d:209:TYR:HA   | 89:d:252:LEU:H    | 1.81                     | 0.46              |
| 89:d:212:ILE:CG1  | 89:d:259:TRP:CZ3  | 2.98                     | 0.46              |
| 25:AA:81:C:H2'    | 25:AA:82:U:O4'    | 2.15                     | 0.46              |
| 7:I:63:SER:O      | 55:r:69:GLN:HB2   | 2.15                     | 0.46              |
| 89:d:93:GLY:H     | 89:d:269:TRP:CB   | 2.29                     | 0.46              |
| 2:B:28:C:H5'      | 38:8:129:ARG:HD3  | 1.98                     | 0.46              |
| 20:V:105:ARG:HH11 | 89:d:171:ASP:HB2  | 1.81                     | 0.46              |
| 89:d:164:VAL:HA   | 89:d:260:ARG:HB3  | 1.98                     | 0.46              |
| 20:V:26:PRO:CG    | 89:d:74:ARG:HB3   | 2.47                     | 0.45              |
| 87:Ax:16:C:H2'    | 87:Ax:17:A:C2'    | 2.36                     | 0.45              |
| 7:I:63:SER:HB2    | 55:r:108:CYS:HB2  | 1.98                     | 0.45              |
| 71:AR:104:LYS:HA  | 71:AR:104:LYS:HE3 | 1.98                     | 0.45              |
| 20:V:2:ARG:HB2    | 20:V:6:LEU:HB2    | 1.97                     | 0.45              |
| 62:AI:178:ASN:O   | 62:AI:179:THR:C   | 2.59                     | 0.45              |
| 89:d:158:ASP:HA   | 89:d:161:HIS:ND1  | 2.32                     | 0.45              |
| 89:d:250:LYS:HB2  | 89:d:259:TRP:CE2  | 2.51                     | 0.45              |
| 20:V:110:PRO:CG   | 89:d:76:ILE:HG12  | 2.46                     | 0.45              |
| 86:Aw:9:A:H1'     | 86:Aw:45:A:C2'    | 2.32                     | 0.45              |
| 89:d:80:CYS:HB3   | 89:d:167:HIS:CA   | 2.46                     | 0.45              |
| 20:V:2:ARG:CB     | 20:V:6:LEU:HB2    | 2.47                     | 0.45              |
| 25:AA:103:G:C2    | 67:AN:4:VAL:HG22  | 2.52                     | 0.45              |
| 89:d:90:PRO:HB2   | 89:d:268:PRO:CD   | 2.45                     | 0.45              |
| 89:d:153:ASN:HA   | 89:d:181:VAL:CG2  | 2.47                     | 0.45              |
| 87:Ax:50:G:H22    | 87:Ax:51:A:H62    | 1.64                     | 0.45              |
| 93:B:101:VAL:HG21 | 43:e:165:PHE:HA   | 1.99                     | 0.45              |
| 20:V:9:LEU:C      | 20:V:11:SER:N     | 2.73                     | 0.45              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 7:I:60:ILE:HG22    | 7:I:61:HIS:N       | 2.32                     | 0.45              |
| 7:I:64:CYS:HA      | 94:I:301:FES:S2    | 2.57                     | 0.45              |
| 19:U:133:GLU:HA    | 19:U:136:GLN:HG2   | 1.99                     | 0.45              |
| 89:d:102:LYS:HZ2   | 89:d:108:ARG:HD3   | 1.82                     | 0.45              |
| 19:U:133:GLU:C     | 19:U:136:GLN:HG3   | 2.28                     | 0.45              |
| 89:d:212:ILE:HD12  | 89:d:259:TRP:CE3   | 2.50                     | 0.45              |
| 20:V:23:MET:HE3    | 20:V:23:MET:HB2    | 1.87                     | 0.44              |
| 1:A:1696:C:H1'     | 19:U:4:ASN:OD1     | 2.16                     | 0.44              |
| 20:V:108:MET:O     | 89:d:166:GLU:HB3   | 2.16                     | 0.44              |
| 84:A4:458:TYR:HB3  | 84:A4:486:TYR:CD1  | 2.53                     | 0.44              |
| 19:U:111:PHE:HA    | 19:U:115:ASP:OD1   | 2.18                     | 0.44              |
| 20:V:25:PRO:HG2    | 20:V:26:PRO:HD3    | 1.99                     | 0.44              |
| 38:8:84:PRO:HB3    | 54:q:163:LEU:HD13  | 1.98                     | 0.44              |
| 38:8:192:TYR:HE1   | 51:m:78:PRO:HD2    | 1.82                     | 0.44              |
| 62:AI:179:THR:O    | 62:AI:181:ILE:HG13 | 2.17                     | 0.44              |
| 88:Av:43:UNK:N     | 89:d:78:LEU:HD12   | 2.20                     | 0.44              |
| 88:Av:43:UNK:CB    | 89:d:78:LEU:HD12   | 2.47                     | 0.44              |
| 89:d:171:ASP:OD1   | 89:d:172:MET:N     | 2.50                     | 0.44              |
| 20:V:25:PRO:HG2    | 89:d:74:ARG:HB2    | 1.99                     | 0.44              |
| 19:U:144:ARG:HA    | 19:U:144:ARG:HD2   | 1.86                     | 0.44              |
| 89:d:95:ALA:O      | 89:d:96:ARG:C      | 2.61                     | 0.44              |
| 89:d:199:CYS:O     | 89:d:200:SER:HB2   | 2.16                     | 0.44              |
| 38:8:67:ARG:CG     | 87:Ax:46:A:H5'     | 2.47                     | 0.44              |
| 86:Aw:21:A:O2'     | 86:Aw:22:A:H5'     | 2.17                     | 0.44              |
| 19:U:139:SER:O     | 19:U:140:SER:C     | 2.59                     | 0.44              |
| 65:AL:115:ILE:HG21 | 65:AL:181:ILE:HD13 | 2.00                     | 0.44              |
| 65:AL:121:ASP:CB   | 65:AL:125:LEU:HB3  | 2.48                     | 0.44              |
| 87:Ax:26:U:H2'     | 87:Ax:27:C:H6      | 1.82                     | 0.44              |
| 89:d:210:GLY:O     | 89:d:249:GLU:HA    | 2.17                     | 0.44              |
| 89:d:225:TYR:HA    | 89:d:232:MET:N     | 2.26                     | 0.44              |
| 1:A:2366:G:O2'     | 89:d:65:LEU:HD21   | 2.18                     | 0.43              |
| 87:Ax:22:A:N7      | 87:Ax:46:A:H2      | 2.16                     | 0.43              |
| 68:AO:215:ARG:NH1  | 80:A0:154:THR:HG22 | 2.32                     | 0.43              |
| 75:AV:252:LYS:HE3  | 80:A0:152:ALA:HB2  | 2.00                     | 0.43              |
| 35:5:104:CYS:O     | 35:5:268:CYS:CB    | 2.64                     | 0.43              |
| 38:8:101:ARG:HA    | 43:e:84:TYR:CD2    | 2.53                     | 0.43              |
| 75:AV:250:ILE:HD12 | 75:AV:250:ILE:HA   | 1.87                     | 0.43              |
| 75:AV:251:TRP:CH2  | 80:A0:150:PHE:CE1  | 3.06                     | 0.43              |
| 89:d:118:SER:HB2   | 89:d:197:VAL:N     | 2.31                     | 0.43              |
| 89:d:149:HIS:HB2   | 89:d:183:TRP:CZ3   | 2.53                     | 0.43              |
| 19:U:115:ASP:HB3   | 19:U:116:GLU:H     | 1.58                     | 0.43              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 2:B:49:U:O4        | 2:B:65:C:N3        | 2.51                     | 0.43              |
| 68:AO:218:ARG:NH2  | 80:A0:154:THR:HG21 | 2.34                     | 0.43              |
| 25:AA:79:C:H1'     | 67:AN:5:ARG:O      | 2.18                     | 0.43              |
| 25:AA:879:U:H1'    | 25:AA:880:A:O5'    | 2.18                     | 0.43              |
| 80:A0:81:THR:HB    | 80:A0:150:PHE:CE2  | 2.53                     | 0.43              |
| 34:w:63:LYS:HE3    | 34:v:74:LEU:HD21   | 2.00                     | 0.43              |
| 87:Ax:44:A:H2'     | 87:Ax:44:A:N3      | 2.33                     | 0.43              |
| 18:T:50:LYS:HA     | 89:d:178:TYR:HE1   | 1.84                     | 0.43              |
| 80:A0:142:VAL:HG13 | 80:A0:150:PHE:HB2  | 2.01                     | 0.43              |
| 86:Aw:6:U:H2'      | 86:Aw:7:A:C8       | 2.54                     | 0.43              |
| 89:d:202:MET:HG3   | 89:d:203:MET:O     | 2.19                     | 0.43              |
| 25:AA:694:C:H4'    | 79:AZ:102:ALA:HB2  | 2.01                     | 0.43              |
| 87:Ax:17:A:H1'     | 87:Ax:22:A:O5'     | 2.19                     | 0.43              |
| 87:Ax:46:A:C4      | 87:Ax:48:U:H1'     | 2.53                     | 0.43              |
| 20:V:16:PRO:HB2    | 20:V:21:TYR:HB3    | 2.00                     | 0.42              |
| 65:AL:112:MET:O    | 65:AL:116:VAL:HG13 | 2.19                     | 0.42              |
| 65:AL:120:GLU:HA   | 65:AL:174:ASN:HB3  | 2.01                     | 0.42              |
| 19:U:1:ACE:H3      | 19:U:19:VAL:CG2    | 2.46                     | 0.42              |
| 20:V:36:PRO:O      | 20:V:39:ILE:HG12   | 2.19                     | 0.42              |
| 89:d:212:ILE:O     | 89:d:247:VAL:HA    | 2.20                     | 0.42              |
| 93:B:101:VAL:HA    | 43:e:217:PHE:CD1   | 2.54                     | 0.42              |
| 38:8:83:ILE:HD12   | 44:f:199:LYS:HA    | 2.01                     | 0.42              |
| 81:A1:46:ARG:HB2   | 81:A1:47:PRO:HD3   | 2.00                     | 0.42              |
| 19:U:117:SER:HB2   | 19:U:120:GLY:HA3   | 2.01                     | 0.42              |
| 72:AS:115:GLU:O    | 72:AS:118:PHE:HB3  | 2.20                     | 0.42              |
| 1:A:2785:C:H3'     | 1:A:2786:U:C5'     | 2.50                     | 0.42              |
| 20:V:105:ARG:NH1   | 89:d:171:ASP:HB2   | 2.35                     | 0.42              |
| 44:f:80:ILE:HD11   | 44:f:191:GLU:HG3   | 2.01                     | 0.42              |
| 61:AH:182:GLU:HA   | 61:AH:185:LYS:HG2  | 2.01                     | 0.42              |
| 84:A4:577:ASN:OD1  | 84:A4:610:LEU:HB2  | 2.20                     | 0.42              |
| 38:8:65:LYS:O      | 38:8:69:LYS:HG2    | 2.19                     | 0.42              |
| 44:f:100:MET:HE1   | 51:m:45:ARG:HE     | 1.85                     | 0.42              |
| 89:d:157:HIS:HB3   | 89:d:169:PHE:CZ    | 2.55                     | 0.42              |
| 89:d:183:TRP:CH2   | 89:d:185:PHE:HB2   | 2.54                     | 0.42              |
| 34:w:63:LYS:HD2    | 34:v:82:LEU:HB3    | 2.01                     | 0.42              |
| 74:AU:51:ALA:O     | 74:AU:54:PHE:HB3   | 2.20                     | 0.42              |
| 88:Av:45:UNK:O     | 88:Av:49:UNK:N     | 2.53                     | 0.42              |
| 89:d:211:GLN:HG2   | 89:d:249:GLU:HB2   | 2.01                     | 0.42              |
| 17:S:146:LYS:H     | 17:S:146:LYS:HG3   | 1.61                     | 0.42              |
| 20:V:36:PRO:HD2    | 20:V:39:ILE:HD13   | 2.02                     | 0.42              |
| 24:Z:155:GLU:HA    | 40:a:56:ARG:HH22   | 1.85                     | 0.42              |

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| Atom-1             | Atom-2             | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|--------------------|--------------------------|-------------------|
| 89:d:198:ARG:HD3   | 89:d:198:ARG:HA    | 1.96                     | 0.42              |
| 38:8:63:GLU:C      | 38:8:67:ARG:HE     | 2.27                     | 0.41              |
| 38:8:67:ARG:HD2    | 87:Ax:46:A:H5'     | 2.01                     | 0.41              |
| 89:d:153:ASN:HA    | 89:d:181:VAL:HG23  | 2.02                     | 0.41              |
| 1:A:1805:A:OP2     | 20:V:96:ARG:HB3    | 2.19                     | 0.41              |
| 19:U:111:PHE:C     | 19:U:115:ASP:HB2   | 2.45                     | 0.41              |
| 25:AA:78:C:H6      | 25:AA:78:C:O5'     | 2.02                     | 0.41              |
| 25:AA:329:A:H5''   | 70:AQ:1:ACE:H1     | 2.02                     | 0.41              |
| 89:d:225:TYR:CA    | 89:d:232:MET:H     | 2.26                     | 0.41              |
| 89:d:262:HIS:O     | 89:d:263:THR:HB    | 2.20                     | 0.41              |
| 60:AG:210:VAL:HG12 | 60:AG:210:VAL:O    | 2.20                     | 0.41              |
| 6:H:201:VAL:HG11   | 6:H:206:LEU:HD21   | 2.03                     | 0.41              |
| 19:U:114:LYS:O     | 19:U:115:ASP:C     | 2.63                     | 0.41              |
| 38:8:93:LYS:O      | 38:8:99:ARG:NH1    | 2.53                     | 0.41              |
| 54:q:170:PRO:HB3   | 87:Ax:56:C:H4'     | 2.03                     | 0.41              |
| 68:AO:218:ARG:HH21 | 80:A0:154:THR:HG21 | 1.85                     | 0.41              |
| 89:d:109:THR:O     | 89:d:110:GLU:C     | 2.63                     | 0.41              |
| 6:H:247:ARG:HA     | 6:H:251:TRP:HB3    | 2.02                     | 0.41              |
| 19:U:20:PHE:CD1    | 20:V:195:GLN:HG3   | 2.56                     | 0.41              |
| 19:U:37:GLU:HB3    | 19:U:104:THR:HB    | 2.03                     | 0.41              |
| 19:U:143:ARG:HG3   | 89:d:282:ILE:HD11  | 2.02                     | 0.41              |
| 20:V:105:ARG:HH11  | 89:d:171:ASP:CA    | 2.33                     | 0.41              |
| 34:x:67:LEU:HD22   | 34:y:67:LEU:HD22   | 2.03                     | 0.41              |
| 38:8:78:ALA:HB3    | 44:f:201:ARG:HH12  | 1.84                     | 0.41              |
| 44:f:122:GLU:HB2   | 44:f:158:GLN:HG2   | 2.01                     | 0.41              |
| 89:d:216:MET:HG3   | 89:d:244:GLU:HB2   | 2.03                     | 0.41              |
| 89:d:217:HIS:NE2   | 89:d:241:ASP:HB2   | 2.35                     | 0.41              |
| 19:U:118:PRO:O     | 19:U:119:GLU:C     | 2.63                     | 0.41              |
| 20:V:133:ILE:HD12  | 20:V:145:ARG:HB2   | 2.02                     | 0.41              |
| 65:AL:102:GLU:O    | 65:AL:106:ILE:HD12 | 2.21                     | 0.41              |
| 7:I:60:ILE:HG22    | 7:I:61:HIS:H       | 1.86                     | 0.41              |
| 51:m:125:ARG:HH22  | 61:AH:182:GLU:HB2  | 1.85                     | 0.41              |
| 60:AG:395:LYS:HD2  | 60:AG:395:LYS:O    | 2.20                     | 0.41              |
| 74:AU:54:PHE:HD1   | 80:A0:157:PRO:CB   | 2.34                     | 0.41              |
| 79:AZ:11:MET:HE3   | 81:A1:192:LYS:HB2  | 2.03                     | 0.41              |
| 89:d:247:VAL:HG12  | 89:d:262:HIS:HB3   | 2.04                     | 0.41              |
| 34:w:63:LYS:HG3    | 34:w:64:ILE:N      | 2.36                     | 0.40              |
| 87:Ax:46:A:H3'     | 87:Ax:46:A:H8      | 1.85                     | 0.40              |
| 1:A:3040:OMG:HM22  | 1:A:3040:OMG:H1'   | 1.64                     | 0.40              |
| 1:A:3201:A:H2'     | 1:A:3202:U:O4'     | 2.20                     | 0.40              |
| 7:I:61:HIS:CE1     | 55:r:108:CYS:HB2   | 2.57                     | 0.40              |

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| Atom-1             | Atom-2            | Interatomic distance (Å) | Clash overlap (Å) |
|--------------------|-------------------|--------------------------|-------------------|
| 19:U:111:PHE:CD2   | 19:U:115:ASP:CG   | 2.96                     | 0.40              |
| 38:8:187:PRO:O     | 38:8:188:PRO:C    | 2.65                     | 0.40              |
| 34:v:79:ILE:HA     | 34:v:82:LEU:CD2   | 2.52                     | 0.40              |
| 65:AL:65:ASP:HB2   | 65:AL:110:GLN:HG3 | 2.02                     | 0.40              |
| 88:Av:40:UNK:N     | 89:d:78:LEU:HD13  | 2.37                     | 0.40              |
| 89:d:106:ILE:O     | 89:d:107:GLU:HB2  | 2.22                     | 0.40              |
| 1:A:2380:C:H3'     | 1:A:2381:A:C5'    | 2.52                     | 0.40              |
| 1:A:3040:OMG:H2'   | 1:A:3041:U:O4'    | 2.21                     | 0.40              |
| 87:Ax:8:U:C2       | 87:Ax:14:A:N7     | 2.89                     | 0.40              |
| 89:d:212:ILE:HD12  | 89:d:259:TRP:CH2  | 2.37                     | 0.40              |
| 89:d:250:LYS:HG2   | 89:d:258:SER:HA   | 2.03                     | 0.40              |
| 65:AL:177:VAL:HG12 | 65:AL:177:VAL:O   | 2.22                     | 0.40              |
| 75:AV:251:TRP:HH2  | 80:A0:150:PHE:CD1 | 2.33                     | 0.40              |
| 79:AZ:10:ARG:HD2   | 79:AZ:11:MET:N    | 2.36                     | 0.40              |

There are no symmetry-related clashes.

## 5.3 Torsion angles [i](#)

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

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all 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   | D     | 236/305 (77%) | 231 (98%)  | 5 (2%)  | 0        | 100         | 100 |
| 4   | E     | 303/348 (87%) | 297 (98%)  | 6 (2%)  | 0        | 100         | 100 |
| 5   | F     | 250/311 (80%) | 245 (98%)  | 5 (2%)  | 0        | 100         | 100 |
| 6   | H     | 200/267 (75%) | 194 (97%)  | 6 (3%)  | 0        | 100         | 100 |
| 7   | I     | 210/261 (80%) | 201 (96%)  | 9 (4%)  | 0        | 100         | 100 |
| 8   | J     | 173/192 (90%) | 173 (100%) | 0       | 0        | 100         | 100 |
| 9   | K     | 176/178 (99%) | 176 (100%) | 0       | 0        | 100         | 100 |
| 10  | L     | 113/145 (78%) | 112 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 11  | M     | 289/296 (98%) | 284 (98%)  | 5 (2%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed      | Favoured   | Allowed | Outliers | Percentiles |     |
|-----|-------|---------------|------------|---------|----------|-------------|-----|
| 12  | N     | 220/251 (88%) | 220 (100%) | 0       | 0        | 100         | 100 |
| 13  | O     | 152/175 (87%) | 151 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 14  | P     | 142/180 (79%) | 140 (99%)  | 2 (1%)  | 0        | 100         | 100 |
| 15  | Q     | 237/292 (81%) | 234 (99%)  | 3 (1%)  | 0        | 100         | 100 |
| 16  | R     | 138/149 (93%) | 137 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 17  | S     | 159/205 (78%) | 156 (98%)  | 3 (2%)  | 0        | 100         | 100 |
| 18  | T     | 164/206 (80%) | 164 (100%) | 0       | 0        | 100         | 100 |
| 19  | U     | 151/153 (99%) | 142 (94%)  | 9 (6%)  | 0        | 100         | 100 |
| 20  | V     | 214/216 (99%) | 210 (98%)  | 3 (1%)  | 1 (0%)   | 24          | 57  |
| 21  | W     | 111/148 (75%) | 110 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 22  | X     | 242/256 (94%) | 241 (100%) | 1 (0%)  | 0        | 100         | 100 |
| 23  | Y     | 179/250 (72%) | 177 (99%)  | 2 (1%)  | 0        | 100         | 100 |
| 24  | Z     | 120/161 (74%) | 119 (99%)  | 1 (1%)  | 0        | 100         | 100 |
| 26  | AB    | 223/296 (75%) | 220 (99%)  | 3 (1%)  | 0        | 100         | 100 |
| 27  | AC    | 130/167 (78%) | 126 (97%)  | 4 (3%)  | 0        | 100         | 100 |
| 28  | 0     | 108/188 (57%) | 108 (100%) | 0       | 0        | 100         | 100 |
| 29  | 1     | 54/65 (83%)   | 54 (100%)  | 0       | 0        | 100         | 100 |
| 30  | 2     | 44/92 (48%)   | 44 (100%)  | 0       | 0        | 100         | 100 |
| 31  | 3     | 93/188 (50%)  | 92 (99%)   | 1 (1%)  | 0        | 100         | 100 |
| 32  | 4     | 36/103 (35%)  | 36 (100%)  | 0       | 0        | 100         | 100 |
| 33  | z     | 250/325 (77%) | 240 (96%)  | 10 (4%) | 0        | 100         | 100 |
| 34  | t     | 44/198 (22%)  | 44 (100%)  | 0       | 0        | 100         | 100 |
| 34  | u     | 30/198 (15%)  | 30 (100%)  | 0       | 0        | 100         | 100 |
| 34  | v     | 30/198 (15%)  | 30 (100%)  | 0       | 0        | 100         | 100 |
| 34  | w     | 29/198 (15%)  | 28 (97%)   | 1 (3%)  | 0        | 100         | 100 |
| 34  | x     | 29/198 (15%)  | 29 (100%)  | 0       | 0        | 100         | 100 |
| 34  | y     | 29/198 (15%)  | 29 (100%)  | 0       | 0        | 100         | 100 |
| 35  | 5     | 389/423 (92%) | 384 (99%)  | 5 (1%)  | 0        | 100         | 100 |
| 36  | 6     | 352/380 (93%) | 342 (97%)  | 10 (3%) | 0        | 100         | 100 |
| 37  | 7     | 292/338 (86%) | 281 (96%)  | 11 (4%) | 0        | 100         | 100 |
| 38  | 8     | 142/206 (69%) | 131 (92%)  | 11 (8%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed      | Favoured   | Allowed  | Outliers | Percentiles |     |
|-----|-------|---------------|------------|----------|----------|-------------|-----|
| 39  | 9     | 122/137 (89%) | 117 (96%)  | 5 (4%)   | 0        | 100         | 100 |
| 40  | a     | 96/142 (68%)  | 88 (92%)   | 8 (8%)   | 0        | 100         | 100 |
| 41  | b     | 149/215 (69%) | 145 (97%)  | 4 (3%)   | 0        | 100         | 100 |
| 42  | c     | 282/332 (85%) | 279 (99%)  | 3 (1%)   | 0        | 100         | 100 |
| 43  | e     | 226/279 (81%) | 220 (97%)  | 6 (3%)   | 0        | 100         | 100 |
| 44  | f     | 153/212 (72%) | 138 (90%)  | 15 (10%) | 0        | 100         | 100 |
| 45  | g     | 132/166 (80%) | 129 (98%)  | 3 (2%)   | 0        | 100         | 100 |
| 46  | h     | 108/158 (68%) | 108 (100%) | 0        | 0        | 100         | 100 |
| 47  | i     | 95/128 (74%)  | 94 (99%)   | 1 (1%)   | 0        | 100         | 100 |
| 48  | j     | 92/123 (75%)  | 90 (98%)   | 2 (2%)   | 0        | 100         | 100 |
| 49  | k     | 100/112 (89%) | 100 (100%) | 0        | 0        | 100         | 100 |
| 50  | l     | 80/138 (58%)  | 80 (100%)  | 0        | 0        | 100         | 100 |
| 51  | m     | 90/128 (70%)  | 89 (99%)   | 1 (1%)   | 0        | 100         | 100 |
| 52  | o     | 92/102 (90%)  | 92 (100%)  | 0        | 0        | 100         | 100 |
| 53  | p     | 141/206 (68%) | 139 (99%)  | 2 (1%)   | 0        | 100         | 100 |
| 54  | q     | 164/222 (74%) | 161 (98%)  | 3 (2%)   | 0        | 100         | 100 |
| 55  | r     | 160/196 (82%) | 158 (99%)  | 2 (1%)   | 0        | 100         | 100 |
| 56  | s     | 382/439 (87%) | 372 (97%)  | 10 (3%)  | 0        | 100         | 100 |
| 57  | AD    | 335/430 (78%) | 326 (97%)  | 9 (3%)   | 0        | 100         | 100 |
| 58  | AE    | 120/125 (96%) | 119 (99%)  | 1 (1%)   | 0        | 100         | 100 |
| 59  | AF    | 206/242 (85%) | 205 (100%) | 1 (0%)   | 0        | 100         | 100 |
| 60  | AG    | 324/396 (82%) | 319 (98%)  | 5 (2%)   | 0        | 100         | 100 |
| 61  | AH    | 138/201 (69%) | 135 (98%)  | 3 (2%)   | 0        | 100         | 100 |
| 62  | AI    | 134/194 (69%) | 133 (99%)  | 1 (1%)   | 0        | 100         | 100 |
| 63  | AJ    | 106/138 (77%) | 104 (98%)  | 2 (2%)   | 0        | 100         | 100 |
| 64  | AK    | 99/128 (77%)  | 98 (99%)   | 1 (1%)   | 0        | 100         | 100 |
| 65  | AL    | 172/257 (67%) | 161 (94%)  | 11 (6%)  | 0        | 100         | 100 |
| 66  | AM    | 117/137 (85%) | 116 (99%)  | 1 (1%)   | 0        | 100         | 100 |
| 67  | AN    | 108/130 (83%) | 106 (98%)  | 2 (2%)   | 0        | 100         | 100 |
| 68  | AO    | 191/258 (74%) | 189 (99%)  | 2 (1%)   | 0        | 100         | 100 |
| 69  | AP    | 95/142 (67%)  | 94 (99%)   | 1 (1%)   | 0        | 100         | 100 |

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| Mol | Chain | Analysed          | Favoured    | Allowed  | Outliers | Percentiles |     |
|-----|-------|-------------------|-------------|----------|----------|-------------|-----|
| 70  | AQ    | 85/87 (98%)       | 82 (96%)    | 3 (4%)   | 0        | 100         | 100 |
| 71  | AR    | 293/360 (81%)     | 283 (97%)   | 10 (3%)  | 0        | 100         | 100 |
| 72  | AS    | 133/190 (70%)     | 131 (98%)   | 2 (2%)   | 0        | 100         | 100 |
| 73  | AT    | 166/173 (96%)     | 164 (99%)   | 2 (1%)   | 0        | 100         | 100 |
| 74  | AU    | 174/205 (85%)     | 173 (99%)   | 1 (1%)   | 0        | 100         | 100 |
| 75  | AV    | 358/414 (86%)     | 350 (98%)   | 8 (2%)   | 0        | 100         | 100 |
| 76  | AW    | 98/187 (52%)      | 95 (97%)    | 3 (3%)   | 0        | 100         | 100 |
| 77  | AX    | 350/398 (88%)     | 343 (98%)   | 7 (2%)   | 0        | 100         | 100 |
| 78  | AY    | 147/395 (37%)     | 144 (98%)   | 3 (2%)   | 0        | 100         | 100 |
| 79  | AZ    | 98/106 (92%)      | 92 (94%)    | 6 (6%)   | 0        | 100         | 100 |
| 80  | A0    | 213/217 (98%)     | 207 (97%)   | 6 (3%)   | 0        | 100         | 100 |
| 81  | A1    | 277/323 (86%)     | 274 (99%)   | 3 (1%)   | 0        | 100         | 100 |
| 82  | A2    | 116/118 (98%)     | 116 (100%)  | 0        | 0        | 100         | 100 |
| 83  | A3    | 68/199 (34%)      | 67 (98%)    | 1 (2%)   | 0        | 100         | 100 |
| 84  | A4    | 584/689 (85%)     | 576 (99%)   | 8 (1%)   | 0        | 100         | 100 |
| 89  | d     | 237/306 (78%)     | 214 (90%)   | 22 (9%)  | 1 (0%)   | 30          | 61  |
| 90  | Au    | 47/435 (11%)      | 46 (98%)    | 1 (2%)   | 0        | 100         | 100 |
| All | All   | 14736/19919 (74%) | 14423 (98%) | 311 (2%) | 2 (0%)   | 100         | 100 |

All (2) Ramachandran outliers are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 20  | V     | 10  | ALA  |
| 89  | d     | 71  | LYS  |

### 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   | D     | 192/245 (78%) | 192 (100%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed       | Rotameric  | Outliers | Percentiles |     |
|-----|-------|----------------|------------|----------|-------------|-----|
| 4   | E     | 260/290 (90%)  | 260 (100%) | 0        | 100         | 100 |
| 5   | F     | 219/262 (84%)  | 219 (100%) | 0        | 100         | 100 |
| 6   | H     | 182/228 (80%)  | 182 (100%) | 0        | 100         | 100 |
| 7   | I     | 194/232 (84%)  | 194 (100%) | 0        | 100         | 100 |
| 8   | J     | 138/150 (92%)  | 138 (100%) | 0        | 100         | 100 |
| 9   | K     | 155/155 (100%) | 154 (99%)  | 1 (1%)   | 78          | 79  |
| 10  | L     | 98/124 (79%)   | 98 (100%)  | 0        | 100         | 100 |
| 11  | M     | 246/249 (99%)  | 246 (100%) | 0        | 100         | 100 |
| 12  | N     | 189/211 (90%)  | 189 (100%) | 0        | 100         | 100 |
| 13  | O     | 134/150 (89%)  | 134 (100%) | 0        | 100         | 100 |
| 14  | P     | 126/155 (81%)  | 126 (100%) | 0        | 100         | 100 |
| 15  | Q     | 221/256 (86%)  | 221 (100%) | 0        | 100         | 100 |
| 16  | R     | 118/126 (94%)  | 118 (100%) | 0        | 100         | 100 |
| 17  | S     | 146/180 (81%)  | 144 (99%)  | 2 (1%)   | 59          | 71  |
| 18  | T     | 146/176 (83%)  | 146 (100%) | 0        | 100         | 100 |
| 19  | U     | 134/134 (100%) | 134 (100%) | 0        | 100         | 100 |
| 20  | V     | 191/191 (100%) | 191 (100%) | 0        | 100         | 100 |
| 21  | W     | 91/119 (76%)   | 91 (100%)  | 0        | 100         | 100 |
| 22  | X     | 220/229 (96%)  | 220 (100%) | 0        | 100         | 100 |
| 23  | Y     | 163/223 (73%)  | 163 (100%) | 0        | 100         | 100 |
| 24  | Z     | 113/147 (77%)  | 113 (100%) | 0        | 100         | 100 |
| 26  | AB    | 198/249 (80%)  | 198 (100%) | 0        | 100         | 100 |
| 27  | AC    | 115/143 (80%)  | 115 (100%) | 0        | 100         | 100 |
| 28  | 0     | 99/164 (60%)   | 99 (100%)  | 0        | 100         | 100 |
| 29  | 1     | 53/60 (88%)    | 53 (100%)  | 0        | 100         | 100 |
| 30  | 2     | 40/72 (56%)    | 40 (100%)  | 0        | 100         | 100 |
| 31  | 3     | 88/166 (53%)   | 88 (100%)  | 0        | 100         | 100 |
| 32  | 4     | 37/89 (42%)    | 37 (100%)  | 0        | 100         | 100 |
| 33  | z     | 226/287 (79%)  | 226 (100%) | 0        | 100         | 100 |
| 34  | t     | 40/158 (25%)   | 40 (100%)  | 0        | 100         | 100 |
| 34  | u     | 31/158 (20%)   | 31 (100%)  | 0        | 100         | 100 |

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| Mol | Chain | Analysed      | Rotameric  | Outliers | Percentiles |     |
|-----|-------|---------------|------------|----------|-------------|-----|
| 34  | v     | 31/158 (20%)  | 31 (100%)  | 0        | 100         | 100 |
| 34  | w     | 30/158 (19%)  | 30 (100%)  | 0        | 100         | 100 |
| 34  | x     | 30/158 (19%)  | 30 (100%)  | 0        | 100         | 100 |
| 34  | y     | 30/158 (19%)  | 30 (100%)  | 0        | 100         | 100 |
| 35  | 5     | 352/368 (96%) | 352 (100%) | 0        | 100         | 100 |
| 36  | 6     | 313/332 (94%) | 313 (100%) | 0        | 100         | 100 |
| 37  | 7     | 270/303 (89%) | 270 (100%) | 0        | 100         | 100 |
| 38  | 8     | 133/190 (70%) | 133 (100%) | 0        | 100         | 100 |
| 39  | 9     | 104/112 (93%) | 104 (100%) | 0        | 100         | 100 |
| 40  | a     | 96/133 (72%)  | 96 (100%)  | 0        | 100         | 100 |
| 41  | b     | 132/185 (71%) | 132 (100%) | 0        | 100         | 100 |
| 42  | c     | 251/288 (87%) | 251 (100%) | 0        | 100         | 100 |
| 43  | e     | 200/236 (85%) | 200 (100%) | 0        | 100         | 100 |
| 44  | f     | 139/188 (74%) | 139 (100%) | 0        | 100         | 100 |
| 45  | g     | 124/148 (84%) | 124 (100%) | 0        | 100         | 100 |
| 46  | h     | 104/148 (70%) | 104 (100%) | 0        | 100         | 100 |
| 47  | i     | 86/110 (78%)  | 86 (100%)  | 0        | 100         | 100 |
| 48  | j     | 74/97 (76%)   | 74 (100%)  | 0        | 100         | 100 |
| 49  | k     | 83/89 (93%)   | 83 (100%)  | 0        | 100         | 100 |
| 50  | l     | 76/116 (66%)  | 76 (100%)  | 0        | 100         | 100 |
| 51  | m     | 85/113 (75%)  | 85 (100%)  | 0        | 100         | 100 |
| 52  | o     | 80/87 (92%)   | 80 (100%)  | 0        | 100         | 100 |
| 53  | p     | 135/181 (75%) | 135 (100%) | 0        | 100         | 100 |
| 54  | q     | 143/178 (80%) | 143 (100%) | 0        | 100         | 100 |
| 55  | r     | 147/169 (87%) | 147 (100%) | 0        | 100         | 100 |
| 56  | s     | 340/381 (89%) | 340 (100%) | 0        | 100         | 100 |
| 57  | AD    | 283/357 (79%) | 283 (100%) | 0        | 100         | 100 |
| 58  | AE    | 104/107 (97%) | 104 (100%) | 0        | 100         | 100 |
| 59  | AF    | 185/209 (88%) | 185 (100%) | 0        | 100         | 100 |
| 60  | AG    | 286/342 (84%) | 286 (100%) | 0        | 100         | 100 |
| 61  | AH    | 130/180 (72%) | 130 (100%) | 0        | 100         | 100 |

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| Mol | Chain | Analysed          | Rotameric    | Outliers | Percentiles |     |
|-----|-------|-------------------|--------------|----------|-------------|-----|
| 62  | AI    | 104/146 (71%)     | 104 (100%)   | 0        | 100         | 100 |
| 63  | AJ    | 93/118 (79%)      | 93 (100%)    | 0        | 100         | 100 |
| 64  | AK    | 91/113 (80%)      | 91 (100%)    | 0        | 100         | 100 |
| 65  | AL    | 158/226 (70%)     | 158 (100%)   | 0        | 100         | 100 |
| 66  | AM    | 97/113 (86%)      | 97 (100%)    | 0        | 100         | 100 |
| 67  | AN    | 96/115 (84%)      | 96 (100%)    | 0        | 100         | 100 |
| 68  | AO    | 174/230 (76%)     | 174 (100%)   | 0        | 100         | 100 |
| 69  | AP    | 88/123 (72%)      | 88 (100%)    | 0        | 100         | 100 |
| 70  | AQ    | 78/78 (100%)      | 78 (100%)    | 0        | 100         | 100 |
| 71  | AR    | 264/318 (83%)     | 264 (100%)   | 0        | 100         | 100 |
| 72  | AS    | 116/164 (71%)     | 116 (100%)   | 0        | 100         | 100 |
| 73  | AT    | 153/157 (98%)     | 153 (100%)   | 0        | 100         | 100 |
| 74  | AU    | 152/174 (87%)     | 152 (100%)   | 0        | 100         | 100 |
| 75  | AV    | 325/364 (89%)     | 325 (100%)   | 0        | 100         | 100 |
| 76  | AW    | 87/158 (55%)      | 87 (100%)    | 0        | 100         | 100 |
| 77  | AX    | 311/351 (89%)     | 311 (100%)   | 0        | 100         | 100 |
| 78  | AY    | 137/357 (38%)     | 137 (100%)   | 0        | 100         | 100 |
| 79  | AZ    | 90/95 (95%)       | 90 (100%)    | 0        | 100         | 100 |
| 80  | A0    | 188/189 (100%)    | 188 (100%)   | 0        | 100         | 100 |
| 81  | A1    | 257/291 (88%)     | 257 (100%)   | 0        | 100         | 100 |
| 82  | A2    | 100/100 (100%)    | 100 (100%)   | 0        | 100         | 100 |
| 83  | A3    | 65/166 (39%)      | 65 (100%)    | 0        | 100         | 100 |
| 84  | A4    | 526/609 (86%)     | 526 (100%)   | 0        | 100         | 100 |
| 89  | d     | 219/274 (80%)     | 218 (100%)   | 1 (0%)   | 81          | 80  |
| 90  | Au    | 46/372 (12%)      | 46 (100%)    | 0        | 100         | 100 |
| All | All   | 13194/17158 (77%) | 13190 (100%) | 4 (0%)   | 100         | 100 |

All (4) residues with a non-rotameric sidechain are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 9   | K     | 2   | SER  |
| 17  | S     | 144 | LEU  |
| 17  | S     | 154 | VAL  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 89  | d     | 208 | VAL  |

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (75) such sidechains are listed below:

| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 3   | D     | 252 | HIS  |
| 4   | E     | 233 | GLN  |
| 4   | E     | 292 | HIS  |
| 5   | F     | 98  | GLN  |
| 7   | I     | 36  | HIS  |
| 7   | I     | 219 | HIS  |
| 7   | I     | 235 | GLN  |
| 11  | M     | 114 | GLN  |
| 12  | N     | 101 | HIS  |
| 12  | N     | 222 | ASN  |
| 14  | P     | 79  | HIS  |
| 16  | R     | 89  | ASN  |
| 16  | R     | 149 | HIS  |
| 19  | U     | 84  | ASN  |
| 19  | U     | 136 | GLN  |
| 19  | U     | 138 | GLN  |
| 22  | X     | 15  | GLN  |
| 22  | X     | 93  | ASN  |
| 23  | Y     | 88  | GLN  |
| 27  | AC    | 81  | HIS  |
| 27  | AC    | 154 | HIS  |
| 33  | z     | 104 | HIS  |
| 34  | w     | 83  | ASN  |
| 35  | 5     | 195 | HIS  |
| 35  | 5     | 343 | GLN  |
| 35  | 5     | 385 | HIS  |
| 37  | 7     | 84  | ASN  |
| 38  | 8     | 103 | GLN  |
| 38  | 8     | 186 | GLN  |
| 42  | c     | 172 | ASN  |
| 43  | e     | 75  | GLN  |
| 46  | h     | 119 | GLN  |
| 47  | i     | 120 | HIS  |
| 51  | m     | 44  | HIS  |
| 51  | m     | 46  | GLN  |
| 54  | q     | 138 | GLN  |
| 54  | q     | 147 | GLN  |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 56  | s     | 343 | GLN  |
| 56  | s     | 358 | GLN  |
| 57  | AD    | 356 | GLN  |
| 57  | AD    | 361 | GLN  |
| 57  | AD    | 369 | HIS  |
| 59  | AF    | 147 | GLN  |
| 59  | AF    | 224 | HIS  |
| 60  | AG    | 175 | HIS  |
| 60  | AG    | 308 | GLN  |
| 61  | AH    | 83  | HIS  |
| 64  | AK    | 68  | GLN  |
| 64  | AK    | 117 | HIS  |
| 66  | AM    | 16  | HIS  |
| 67  | AN    | 52  | HIS  |
| 67  | AN    | 79  | HIS  |
| 70  | AQ    | 41  | HIS  |
| 71  | AR    | 246 | HIS  |
| 71  | AR    | 320 | GLN  |
| 73  | AT    | 14  | GLN  |
| 73  | AT    | 37  | HIS  |
| 74  | AU    | 117 | HIS  |
| 75  | AV    | 78  | ASN  |
| 75  | AV    | 358 | GLN  |
| 75  | AV    | 383 | HIS  |
| 77  | AX    | 250 | GLN  |
| 77  | AX    | 394 | HIS  |
| 78  | AY    | 257 | ASN  |
| 83  | A3    | 140 | HIS  |
| 84  | A4    | 122 | ASN  |
| 84  | A4    | 175 | GLN  |
| 84  | A4    | 288 | HIS  |
| 84  | A4    | 434 | GLN  |
| 84  | A4    | 504 | ASN  |
| 84  | A4    | 540 | HIS  |
| 89  | d     | 77  | HIS  |
| 89  | d     | 153 | ASN  |
| 89  | d     | 204 | ASN  |
| 90  | Au    | 403 | HIS  |

### 5.3.3 RNA ⓘ

| Mol | Chain | Analysed        | Backbone Outliers | Pucker Outliers |
|-----|-------|-----------------|-------------------|-----------------|
| 1   | A     | 1556/1561 (99%) | 251 (16%)         | 1 (0%)          |
| 2   | B     | 71/72 (98%)     | 12 (16%)          | 0               |
| 25  | AA    | 953/954 (99%)   | 149 (15%)         | 8 (0%)          |
| 85  | Az    | 32/33 (96%)     | 19 (59%)          | 0               |
| 86  | Aw    | 67/68 (98%)     | 42 (62%)          | 0               |
| 87  | Ax    | 70/71 (98%)     | 48 (68%)          | 0               |
| All | All   | 2749/2759 (99%) | 521 (18%)         | 9 (0%)          |

All (521) RNA backbone outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | A     | 1681 | G    |
| 1   | A     | 1685 | C    |
| 1   | A     | 1689 | C    |
| 1   | A     | 1692 | A    |
| 1   | A     | 1694 | U    |
| 1   | A     | 1699 | C    |
| 1   | A     | 1700 | U    |
| 1   | A     | 1704 | U    |
| 1   | A     | 1708 | A    |
| 1   | A     | 1711 | C    |
| 1   | A     | 1724 | A    |
| 1   | A     | 1727 | A    |
| 1   | A     | 1728 | U    |
| 1   | A     | 1737 | A    |
| 1   | A     | 1748 | G    |
| 1   | A     | 1765 | C    |
| 1   | A     | 1777 | A    |
| 1   | A     | 1780 | U    |
| 1   | A     | 1805 | A    |
| 1   | A     | 1807 | U    |
| 1   | A     | 1809 | U    |
| 1   | A     | 1810 | A    |
| 1   | A     | 1817 | C    |
| 1   | A     | 1821 | A    |
| 1   | A     | 1827 | C    |
| 1   | A     | 1828 | A    |
| 1   | A     | 1829 | A    |
| 1   | A     | 1832 | A    |
| 1   | A     | 1836 | A    |
| 1   | A     | 1844 | A    |
| 1   | A     | 1854 | U    |
| 1   | A     | 1856 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | A     | 1869 | A    |
| 1   | A     | 1871 | A    |
| 1   | A     | 1873 | A    |
| 1   | A     | 1882 | A    |
| 1   | A     | 1886 | G    |
| 1   | A     | 1887 | A    |
| 1   | A     | 1893 | A    |
| 1   | A     | 1901 | C    |
| 1   | A     | 1903 | C    |
| 1   | A     | 1918 | G    |
| 1   | A     | 1937 | A    |
| 1   | A     | 1940 | A    |
| 1   | A     | 1985 | G    |
| 1   | A     | 1992 | C    |
| 1   | A     | 1993 | A    |
| 1   | A     | 1994 | A    |
| 1   | A     | 2000 | C    |
| 1   | A     | 2002 | G    |
| 1   | A     | 2003 | A    |
| 1   | A     | 2015 | G    |
| 1   | A     | 2022 | G    |
| 1   | A     | 2030 | U    |
| 1   | A     | 2036 | C    |
| 1   | A     | 2037 | U    |
| 1   | A     | 2039 | A    |
| 1   | A     | 2054 | U    |
| 1   | A     | 2060 | A    |
| 1   | A     | 2069 | U    |
| 1   | A     | 2071 | U    |
| 1   | A     | 2079 | C    |
| 1   | A     | 2099 | U    |
| 1   | A     | 2113 | G    |
| 1   | A     | 2125 | C    |
| 1   | A     | 2126 | U    |
| 1   | A     | 2132 | A    |
| 1   | A     | 2147 | G    |
| 1   | A     | 2159 | U    |
| 1   | A     | 2160 | A    |
| 1   | A     | 2163 | A    |
| 1   | A     | 2168 | U    |
| 1   | A     | 2173 | G    |
| 1   | A     | 2181 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | A     | 2192 | A    |
| 1   | A     | 2198 | A    |
| 1   | A     | 2200 | A    |
| 1   | A     | 2214 | A    |
| 1   | A     | 2219 | C    |
| 1   | A     | 2220 | A    |
| 1   | A     | 2221 | C    |
| 1   | A     | 2222 | U    |
| 1   | A     | 2223 | A    |
| 1   | A     | 2224 | C    |
| 1   | A     | 2225 | C    |
| 1   | A     | 2226 | U    |
| 1   | A     | 2227 | A    |
| 1   | A     | 2232 | A    |
| 1   | A     | 2233 | U    |
| 1   | A     | 2237 | A    |
| 1   | A     | 2241 | A    |
| 1   | A     | 2243 | A    |
| 1   | A     | 2245 | A    |
| 1   | A     | 2246 | A    |
| 1   | A     | 2247 | C    |
| 1   | A     | 2262 | C    |
| 1   | A     | 2263 | C    |
| 1   | A     | 2284 | C    |
| 1   | A     | 2285 | U    |
| 1   | A     | 2297 | A    |
| 1   | A     | 2300 | G    |
| 1   | A     | 2322 | C    |
| 1   | A     | 2331 | C    |
| 1   | A     | 2332 | C    |
| 1   | A     | 2345 | G    |
| 1   | A     | 2349 | G    |
| 1   | A     | 2350 | A    |
| 1   | A     | 2353 | A    |
| 1   | A     | 2357 | C    |
| 1   | A     | 2363 | A    |
| 1   | A     | 2372 | U    |
| 1   | A     | 2374 | A    |
| 1   | A     | 2390 | A    |
| 1   | A     | 2399 | A    |
| 1   | A     | 2401 | A    |
| 1   | A     | 2404 | U    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | A     | 2406 | A    |
| 1   | A     | 2407 | U    |
| 1   | A     | 2414 | C    |
| 1   | A     | 2415 | C    |
| 1   | A     | 2417 | C    |
| 1   | A     | 2427 | C    |
| 1   | A     | 2446 | A    |
| 1   | A     | 2451 | A    |
| 1   | A     | 2478 | G    |
| 1   | A     | 2485 | U    |
| 1   | A     | 2488 | C    |
| 1   | A     | 2493 | C    |
| 1   | A     | 2502 | C    |
| 1   | A     | 2520 | C    |
| 1   | A     | 2521 | A    |
| 1   | A     | 2527 | A    |
| 1   | A     | 2540 | C    |
| 1   | A     | 2570 | C    |
| 1   | A     | 2573 | G    |
| 1   | A     | 2577 | C    |
| 1   | A     | 2578 | C    |
| 1   | A     | 2580 | U    |
| 1   | A     | 2581 | A    |
| 1   | A     | 2582 | A    |
| 1   | A     | 2592 | G    |
| 1   | A     | 2593 | G    |
| 1   | A     | 2599 | U    |
| 1   | A     | 2600 | A    |
| 1   | A     | 2601 | A    |
| 1   | A     | 2603 | C    |
| 1   | A     | 2617 | 1MA  |
| 1   | A     | 2618 | U    |
| 1   | A     | 2627 | G    |
| 1   | A     | 2629 | A    |
| 1   | A     | 2630 | U    |
| 1   | A     | 2633 | A    |
| 1   | A     | 2635 | G    |
| 1   | A     | 2654 | U    |
| 1   | A     | 2656 | U    |
| 1   | A     | 2683 | C    |
| 1   | A     | 2686 | G    |
| 1   | A     | 2694 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | A     | 2695 | G    |
| 1   | A     | 2696 | A    |
| 1   | A     | 2706 | A    |
| 1   | A     | 2718 | C    |
| 1   | A     | 2719 | G    |
| 1   | A     | 2723 | A    |
| 1   | A     | 2724 | G    |
| 1   | A     | 2725 | A    |
| 1   | A     | 2732 | G    |
| 1   | A     | 2745 | A    |
| 1   | A     | 2757 | A    |
| 1   | A     | 2760 | A    |
| 1   | A     | 2761 | C    |
| 1   | A     | 2762 | C    |
| 1   | A     | 2763 | U    |
| 1   | A     | 2764 | A    |
| 1   | A     | 2765 | A    |
| 1   | A     | 2767 | A    |
| 1   | A     | 2768 | A    |
| 1   | A     | 2775 | A    |
| 1   | A     | 2781 | U    |
| 1   | A     | 2782 | A    |
| 1   | A     | 2785 | C    |
| 1   | A     | 2786 | U    |
| 1   | A     | 2787 | A    |
| 1   | A     | 2790 | A    |
| 1   | A     | 2810 | G    |
| 1   | A     | 2815 | OMG  |
| 1   | A     | 2832 | A    |
| 1   | A     | 2833 | A    |
| 1   | A     | 2847 | C    |
| 1   | A     | 2864 | U    |
| 1   | A     | 2865 | C    |
| 1   | A     | 2882 | U    |
| 1   | A     | 2883 | A    |
| 1   | A     | 2885 | U    |
| 1   | A     | 2888 | A    |
| 1   | A     | 2889 | C    |
| 1   | A     | 2893 | A    |
| 1   | A     | 2913 | A    |
| 1   | A     | 2917 | G    |
| 1   | A     | 2918 | A    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | A     | 2922 | A    |
| 1   | A     | 2928 | C    |
| 1   | A     | 2935 | A    |
| 1   | A     | 2956 | A    |
| 1   | A     | 2965 | A    |
| 1   | A     | 2985 | C    |
| 1   | A     | 2989 | G    |
| 1   | A     | 2990 | A    |
| 1   | A     | 2992 | G    |
| 1   | A     | 3005 | A    |
| 1   | A     | 3016 | G    |
| 1   | A     | 3022 | G    |
| 1   | A     | 3041 | U    |
| 1   | A     | 3053 | A    |
| 1   | A     | 3054 | G    |
| 1   | A     | 3060 | C    |
| 1   | A     | 3066 | C    |
| 1   | A     | 3089 | A    |
| 1   | A     | 3090 | G    |
| 1   | A     | 3096 | U    |
| 1   | A     | 3097 | U    |
| 1   | A     | 3100 | U    |
| 1   | A     | 3102 | U    |
| 1   | A     | 3108 | U    |
| 1   | A     | 3109 | U    |
| 1   | A     | 3110 | C    |
| 1   | A     | 3112 | A    |
| 1   | A     | 3113 | A    |
| 1   | A     | 3150 | U    |
| 1   | A     | 3157 | C    |
| 1   | A     | 3158 | A    |
| 1   | A     | 3162 | C    |
| 1   | A     | 3169 | C    |
| 1   | A     | 3172 | C    |
| 1   | A     | 3177 | A    |
| 1   | A     | 3189 | C    |
| 1   | A     | 3190 | A    |
| 1   | A     | 3194 | U    |
| 1   | A     | 3199 | U    |
| 1   | A     | 3200 | U    |
| 1   | A     | 3207 | A    |
| 1   | A     | 3208 | C    |

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| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | A     | 3209 | A    |
| 1   | A     | 3210 | C    |
| 1   | A     | 3212 | C    |
| 1   | A     | 3217 | A    |
| 1   | A     | 3218 | A    |
| 1   | A     | 3228 | U    |
| 1   | A     | 3229 | U    |
| 1   | A     | 3230 | G    |
| 1   | A     | 3231 | U    |
| 2   | B     | 8    | U    |
| 2   | B     | 10   | 2MG  |
| 2   | B     | 16   | C    |
| 2   | B     | 21   | A    |
| 2   | B     | 45   | G    |
| 2   | B     | 48   | U    |
| 2   | B     | 54   | C    |
| 2   | B     | 55   | U    |
| 2   | B     | 56   | U    |
| 2   | B     | 64   | A    |
| 2   | B     | 69   | U    |
| 2   | B     | 76   | A    |
| 25  | AA    | 4    | A    |
| 25  | AA    | 33   | U    |
| 25  | AA    | 41   | A    |
| 25  | AA    | 44   | A    |
| 25  | AA    | 48   | A    |
| 25  | AA    | 57   | U    |
| 25  | AA    | 74   | U    |
| 25  | AA    | 75   | C    |
| 25  | AA    | 89   | C    |
| 25  | AA    | 90   | C    |
| 25  | AA    | 91   | A    |
| 25  | AA    | 106  | A    |
| 25  | AA    | 114  | A    |
| 25  | AA    | 119  | G    |
| 25  | AA    | 130  | G    |
| 25  | AA    | 144  | G    |
| 25  | AA    | 147  | U    |
| 25  | AA    | 149  | G    |
| 25  | AA    | 168  | C    |
| 25  | AA    | 183  | U    |
| 25  | AA    | 185  | U    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 25  | AA    | 188 | C    |
| 25  | AA    | 189 | A    |
| 25  | AA    | 213 | A    |
| 25  | AA    | 214 | U    |
| 25  | AA    | 219 | A    |
| 25  | AA    | 221 | C    |
| 25  | AA    | 224 | A    |
| 25  | AA    | 243 | C    |
| 25  | AA    | 255 | G    |
| 25  | AA    | 256 | U    |
| 25  | AA    | 257 | C    |
| 25  | AA    | 260 | A    |
| 25  | AA    | 272 | A    |
| 25  | AA    | 282 | A    |
| 25  | AA    | 283 | G    |
| 25  | AA    | 285 | C    |
| 25  | AA    | 291 | A    |
| 25  | AA    | 292 | A    |
| 25  | AA    | 293 | A    |
| 25  | AA    | 295 | A    |
| 25  | AA    | 311 | C    |
| 25  | AA    | 312 | C    |
| 25  | AA    | 313 | C    |
| 25  | AA    | 314 | U    |
| 25  | AA    | 315 | C    |
| 25  | AA    | 316 | C    |
| 25  | AA    | 320 | A    |
| 25  | AA    | 346 | A    |
| 25  | AA    | 354 | C    |
| 25  | AA    | 355 | C    |
| 25  | AA    | 364 | C    |
| 25  | AA    | 365 | A    |
| 25  | AA    | 368 | A    |
| 25  | AA    | 375 | A    |
| 25  | AA    | 394 | A    |
| 25  | AA    | 400 | A    |
| 25  | AA    | 418 | C    |
| 25  | AA    | 434 | U    |
| 25  | AA    | 435 | A    |
| 25  | AA    | 456 | A    |
| 25  | AA    | 458 | C    |
| 25  | AA    | 460 | U    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 25  | AA    | 462 | A    |
| 25  | AA    | 466 | G    |
| 25  | AA    | 470 | A    |
| 25  | AA    | 471 | A    |
| 25  | AA    | 474 | A    |
| 25  | AA    | 479 | A    |
| 25  | AA    | 490 | A    |
| 25  | AA    | 504 | C    |
| 25  | AA    | 506 | C    |
| 25  | AA    | 513 | A    |
| 25  | AA    | 520 | A    |
| 25  | AA    | 532 | G    |
| 25  | AA    | 540 | U    |
| 25  | AA    | 541 | A    |
| 25  | AA    | 542 | U    |
| 25  | AA    | 543 | C    |
| 25  | AA    | 553 | G    |
| 25  | AA    | 568 | U    |
| 25  | AA    | 573 | A    |
| 25  | AA    | 576 | C    |
| 25  | AA    | 578 | C    |
| 25  | AA    | 579 | C    |
| 25  | AA    | 582 | U    |
| 25  | AA    | 599 | U    |
| 25  | AA    | 600 | G    |
| 25  | AA    | 601 | C    |
| 25  | AA    | 603 | C    |
| 25  | AA    | 604 | A    |
| 25  | AA    | 611 | A    |
| 25  | AA    | 624 | C    |
| 25  | AA    | 626 | G    |
| 25  | AA    | 637 | U    |
| 25  | AA    | 643 | C    |
| 25  | AA    | 644 | U    |
| 25  | AA    | 645 | A    |
| 25  | AA    | 665 | C    |
| 25  | AA    | 679 | A    |
| 25  | AA    | 680 | G    |
| 25  | AA    | 696 | A    |
| 25  | AA    | 697 | U    |
| 25  | AA    | 706 | A    |
| 25  | AA    | 707 | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 25  | AA    | 709 | A    |
| 25  | AA    | 729 | C    |
| 25  | AA    | 731 | C    |
| 25  | AA    | 740 | A    |
| 25  | AA    | 758 | C    |
| 25  | AA    | 759 | U    |
| 25  | AA    | 783 | A    |
| 25  | AA    | 816 | G    |
| 25  | AA    | 833 | A    |
| 25  | AA    | 834 | C    |
| 25  | AA    | 856 | G    |
| 25  | AA    | 864 | C    |
| 25  | AA    | 865 | A    |
| 25  | AA    | 866 | A    |
| 25  | AA    | 870 | A    |
| 25  | AA    | 871 | C    |
| 25  | AA    | 872 | A    |
| 25  | AA    | 873 | U    |
| 25  | AA    | 874 | U    |
| 25  | AA    | 877 | A    |
| 25  | AA    | 878 | C    |
| 25  | AA    | 879 | U    |
| 25  | AA    | 880 | A    |
| 25  | AA    | 881 | A    |
| 25  | AA    | 884 | C    |
| 25  | AA    | 885 | C    |
| 25  | AA    | 887 | C    |
| 25  | AA    | 890 | C    |
| 25  | AA    | 891 | G    |
| 25  | AA    | 892 | C    |
| 25  | AA    | 893 | A    |
| 25  | AA    | 900 | U    |
| 25  | AA    | 904 | G    |
| 25  | AA    | 910 | A    |
| 25  | AA    | 917 | A    |
| 25  | AA    | 920 | A    |
| 25  | AA    | 921 | U    |
| 25  | AA    | 924 | U    |
| 25  | AA    | 935 | G    |
| 25  | AA    | 937 | MA6  |
| 25  | AA    | 947 | G    |
| 25  | AA    | 948 | G    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 25  | AA    | 952 | A    |
| 25  | AA    | 955 | C    |
| 85  | Az    | 1   | U    |
| 85  | Az    | 3   | A    |
| 85  | Az    | 4   | A    |
| 85  | Az    | 5   | U    |
| 85  | Az    | 6   | G    |
| 85  | Az    | 12  | U    |
| 85  | Az    | 13  | U    |
| 85  | Az    | 14  | A    |
| 85  | Az    | 15  | U    |
| 85  | Az    | 16  | A    |
| 85  | Az    | 18  | A    |
| 85  | Az    | 21  | A    |
| 85  | Az    | 22  | A    |
| 85  | Az    | 23  | U    |
| 85  | Az    | 24  | U    |
| 85  | Az    | 25  | U    |
| 85  | Az    | 26  | A    |
| 85  | Az    | 27  | C    |
| 85  | Az    | 32  | A    |
| 86  | Aw    | 3   | G    |
| 86  | Aw    | 4   | U    |
| 86  | Aw    | 5   | A    |
| 86  | Aw    | 6   | U    |
| 86  | Aw    | 7   | A    |
| 86  | Aw    | 8   | U    |
| 86  | Aw    | 10  | G    |
| 86  | Aw    | 11  | U    |
| 86  | Aw    | 12  | U    |
| 86  | Aw    | 13  | U    |
| 86  | Aw    | 14  | A    |
| 86  | Aw    | 16  | A    |
| 86  | Aw    | 21  | A    |
| 86  | Aw    | 22  | A    |
| 86  | Aw    | 23  | A    |
| 86  | Aw    | 24  | A    |
| 86  | Aw    | 25  | C    |
| 86  | Aw    | 26  | G    |
| 86  | Aw    | 27  | A    |
| 86  | Aw    | 30  | G    |
| 86  | Aw    | 31  | A    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 86  | Aw    | 32  | U    |
| 86  | Aw    | 36  | C    |
| 86  | Aw    | 44  | C    |
| 86  | Aw    | 46  | A    |
| 86  | Aw    | 48  | U    |
| 86  | Aw    | 49  | U    |
| 86  | Aw    | 51  | U    |
| 86  | Aw    | 53  | A    |
| 86  | Aw    | 56  | A    |
| 86  | Aw    | 61  | U    |
| 86  | Aw    | 65  | A    |
| 86  | Aw    | 67  | U    |
| 86  | Aw    | 68  | U    |
| 86  | Aw    | 69  | A    |
| 86  | Aw    | 70  | C    |
| 86  | Aw    | 71  | C    |
| 86  | Aw    | 72  | A    |
| 86  | Aw    | 73  | A    |
| 86  | Aw    | 74  | C    |
| 86  | Aw    | 75  | C    |
| 86  | Aw    | 76  | A    |
| 87  | Ax    | 3   | G    |
| 87  | Ax    | 6   | A    |
| 87  | Ax    | 7   | A    |
| 87  | Ax    | 8   | U    |
| 87  | Ax    | 9   | A    |
| 87  | Ax    | 10  | G    |
| 87  | Ax    | 11  | U    |
| 87  | Ax    | 12  | U    |
| 87  | Ax    | 14  | A    |
| 87  | Ax    | 15  | A    |
| 87  | Ax    | 16  | C    |
| 87  | Ax    | 17  | A    |
| 87  | Ax    | 22  | A    |
| 87  | Ax    | 25  | C    |
| 87  | Ax    | 28  | C    |
| 87  | Ax    | 29  | U    |
| 87  | Ax    | 33  | U    |
| 87  | Ax    | 35  | A    |
| 87  | Ax    | 36  | U    |
| 87  | Ax    | 37  | C    |
| 87  | Ax    | 38  | C    |

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| Mol | Chain | Res | Type |
|-----|-------|-----|------|
| 87  | Ax    | 41  | A    |
| 87  | Ax    | 42  | G    |
| 87  | Ax    | 43  | G    |
| 87  | Ax    | 44  | A    |
| 87  | Ax    | 45  | G    |
| 87  | Ax    | 46  | A    |
| 87  | Ax    | 48  | U    |
| 87  | Ax    | 49  | G    |
| 87  | Ax    | 50  | G    |
| 87  | Ax    | 51  | A    |
| 87  | Ax    | 52  | G    |
| 87  | Ax    | 55  | U    |
| 87  | Ax    | 56  | C    |
| 87  | Ax    | 57  | A    |
| 87  | Ax    | 58  | A    |
| 87  | Ax    | 59  | U    |
| 87  | Ax    | 60  | U    |
| 87  | Ax    | 62  | C    |
| 87  | Ax    | 63  | U    |
| 87  | Ax    | 64  | C    |
| 87  | Ax    | 66  | U    |
| 87  | Ax    | 67  | U    |
| 87  | Ax    | 71  | U    |
| 87  | Ax    | 72  | A    |
| 87  | Ax    | 73  | A    |
| 87  | Ax    | 75  | C    |
| 87  | Ax    | 76  | A    |

All (9) RNA pucker outliers are listed below:

| Mol | Chain | Res  | Type |
|-----|-------|------|------|
| 1   | A     | 2112 | A    |
| 25  | AA    | 864  | C    |
| 25  | AA    | 865  | A    |
| 25  | AA    | 873  | U    |
| 25  | AA    | 878  | C    |
| 25  | AA    | 879  | U    |
| 25  | AA    | 884  | C    |
| 25  | AA    | 890  | C    |
| 25  | AA    | 892  | C    |

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

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

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

| Mol | Type | Chain | Res  | Link    | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|---------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |         | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 1   | OMG  | A     | 3040 | 1,86    | 23,26,27     | 0.57 | 0        | 33,38,41    | 0.85 | 1 (3%)   |
| 25  | B8T  | AA    | 839  | 25,92   | 19,22,23     | 0.38 | 0        | 26,31,34    | 0.50 | 0        |
| 1   | OMG  | A     | 2815 | 91,1,87 | 23,26,27     | 0.48 | 0        | 33,38,41    | 0.34 | 0        |
| 25  | MA6  | AA    | 937  | 25      | 23,26,27     | 0.39 | 0        | 34,38,41    | 0.64 | 2 (5%)   |
| 1   | PSU  | A     | 3067 | 1       | 18,21,22     | 0.58 | 0        | 22,30,33    | 0.63 | 1 (4%)   |
| 1   | 1MA  | A     | 2617 | 1       | 21,25,26     | 0.52 | 0        | 31,37,40    | 1.01 | 2 (6%)   |
| 1   | OMU  | A     | 3039 | 91,1    | 19,22,23     | 0.37 | 0        | 26,31,34    | 0.49 | 0        |
| 2   | 2MG  | B     | 10   | 2       | 23,26,27     | 0.63 | 0        | 32,38,41    | 0.66 | 1 (3%)   |
| 25  | MA6  | AA    | 936  | 25      | 23,26,27     | 0.33 | 0        | 34,38,41    | 0.62 | 1 (2%)   |
| 62  | 5F0  | AI    | 184  | 62      | 8,8,9        | 1.43 | 2 (25%)  | 7,9,11      | 2.68 | 1 (14%)  |
| 2   | PSU  | B     | 39   | 2       | 18,21,22     | 0.56 | 0        | 22,30,33    | 0.51 | 0        |
| 25  | 5MC  | AA    | 841  | 25      | 18,22,23     | 0.41 | 0        | 26,32,35    | 0.94 | 1 (3%)   |
| 25  | 5MU  | AA    | 429  | 25      | 19,22,23     | 0.36 | 0        | 28,32,35    | 0.30 | 0        |
| 2   | 1MA  | B     | 9    | 2       | 21,25,26     | 0.41 | 0        | 31,37,40    | 1.01 | 2 (6%)   |

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

| Mol | Type | Chain | Res  | Link    | Chirals | Torsions   | Rings   |
|-----|------|-------|------|---------|---------|------------|---------|
| 1   | OMG  | A     | 3040 | 1,86    | -       | 1/9/27/28  | 0/3/3/3 |
| 25  | B8T  | AA    | 839  | 25,92   | -       | 2/7/27/28  | 0/2/2/2 |
| 1   | OMG  | A     | 2815 | 91,1,87 | -       | 1/9/27/28  | 0/3/3/3 |
| 25  | MA6  | AA    | 937  | 25      | -       | 1/11/29/30 | 0/3/3/3 |
| 1   | PSU  | A     | 3067 | 1       | -       | 0/7/25/26  | 0/2/2/2 |
| 1   | 1MA  | A     | 2617 | 1       | -       | 2/7/25/26  | 0/3/3/3 |
| 1   | OMU  | A     | 3039 | 91,1    | -       | 0/9/27/28  | 0/2/2/2 |
| 2   | 2MG  | B     | 10   | 2       | -       | 2/9/27/28  | 0/3/3/3 |

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| Mol | Type | Chain | Res | Link | Chirals | Torsions   | Rings   |
|-----|------|-------|-----|------|---------|------------|---------|
| 25  | MA6  | AA    | 936 | 25   | -       | 0/11/29/30 | 0/3/3/3 |
| 62  | 5F0  | AI    | 184 | 62   | -       | 5/9/9/10   | -       |
| 2   | PSU  | B     | 39  | 2    | -       | 0/7/25/26  | 0/2/2/2 |
| 25  | 5MC  | AA    | 841 | 25   | -       | 0/7/25/26  | 0/2/2/2 |
| 25  | 5MU  | AA    | 429 | 25   | -       | 0/7/25/26  | 0/2/2/2 |
| 2   | 1MA  | B     | 9   | 2    | -       | 0/7/25/26  | 0/3/3/3 |

All (2) bond length outliers are listed below:

| Mol | Chain | Res | Type | Atoms | Z     | Observed(Å) | Ideal(Å) |
|-----|-------|-----|------|-------|-------|-------------|----------|
| 62  | AI    | 184 | 5F0  | CB-CA | -3.05 | 1.47        | 1.54     |
| 62  | AI    | 184 | 5F0  | CB-C  | -2.59 | 1.43        | 1.49     |

All (12) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms       | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|-------------|-------|-------------|----------|
| 62  | AI    | 184  | 5F0  | CA-CB-C     | -6.80 | 85.11       | 114.50   |
| 1   | A     | 2617 | 1MA  | O3'-C3'-C2' | 2.98  | 121.45      | 111.82   |
| 1   | A     | 3040 | OMG  | C2'-C1'-N9  | -2.72 | 108.94      | 114.22   |
| 2   | B     | 9    | 1MA  | O3'-C3'-C2' | 2.71  | 120.59      | 111.82   |
| 2   | B     | 9    | 1MA  | O3'-C3'-C4' | 2.51  | 118.32      | 111.05   |
| 25  | AA    | 936  | MA6  | C2-N1-C6    | 2.30  | 117.19      | 111.75   |
| 25  | AA    | 937  | MA6  | C2-N1-C6    | 2.25  | 117.07      | 111.75   |
| 25  | AA    | 841  | 5MC  | C2'-C3'-C4' | 2.18  | 106.88      | 102.64   |
| 1   | A     | 2617 | 1MA  | C2'-C3'-C4' | 2.08  | 106.69      | 102.64   |
| 2   | B     | 10   | 2MG  | O3'-C3'-C4' | 2.04  | 116.94      | 111.05   |
| 1   | A     | 3067 | PSU  | O4'-C1'-C2' | 2.01  | 107.97      | 105.14   |
| 25  | AA    | 937  | MA6  | N1-C6-N6    | -2.00 | 114.90      | 117.08   |

There are no chirality outliers.

All (14) torsion outliers are listed below:

| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 1   | A     | 2815 | OMG  | C1'-C2'-O2'-CM2 |
| 1   | A     | 3040 | OMG  | C1'-C2'-O2'-CM2 |
| 2   | B     | 10   | 2MG  | O4'-C4'-C5'-O5' |
| 62  | AI    | 184  | 5F0  | O1-C1-CA-CB     |
| 62  | AI    | 184  | 5F0  | OD1-C1-CA-CB    |
| 62  | AI    | 184  | 5F0  | N-CA-CB-C       |
| 62  | AI    | 184  | 5F0  | C1-CA-CB-C      |
| 62  | AI    | 184  | 5F0  | O-C-CB-CA       |

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| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 1   | A     | 2617 | 1MA  | O4'-C4'-C5'-O5' |
| 1   | A     | 2617 | 1MA  | C3'-C4'-C5'-O5' |
| 2   | B     | 10   | 2MG  | C3'-C4'-C5'-O5' |
| 25  | AA    | 937  | MA6  | C4'-C5'-O5'-P   |
| 25  | AA    | 839  | B8T  | O4'-C4'-C5'-O5' |
| 25  | AA    | 839  | B8T  | C3'-C4'-C5'-O5' |

There are no ring outliers.

6 monomers are involved in 10 short contacts:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 1   | A     | 3040 | OMG  | 2       | 0            |
| 25  | AA    | 937  | MA6  | 1       | 0            |
| 2   | B     | 10   | 2MG  | 1       | 0            |
| 25  | AA    | 936  | MA6  | 2       | 0            |
| 2   | B     | 39   | PSU  | 3       | 0            |
| 25  | AA    | 841  | 5MC  | 2       | 0            |

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

Of 260 ligands modelled in this entry, 253 are monoatomic - leaving 7 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 | $\# Z  > 2$ |
| 93  | VAL  | B     | 101 | 2     | 4,6,7        | 0.74 | 0           | 6,7,9       | 1.13 | 1 (16%)     |
| 94  | FES  | I     | 301 | 55,7  | 0,4,4        | -    | -           | -           |      |             |
| 94  | FES  | AE    | 201 | 58,69 | 0,4,4        | -    | -           | -           |      |             |
| 98  | GDP  | AX    | 503 | -     | 28,30,30     | 0.36 | 0           | 44,47,47    | 0.44 | 0           |
| 97  | ATP  | AX    | 501 | 92    | 29,33,33     | 0.37 | 0           | 44,52,52    | 0.67 | 0           |

| Mol | Type | Chain | Res  | Link  | Bond lengths |      |          | Bond angles |      |          |
|-----|------|-------|------|-------|--------------|------|----------|-------------|------|----------|
|     |      |       |      |       | Counts       | RMSZ | # Z  > 2 | Counts      | RMSZ | # Z  > 2 |
| 95  | NAD  | AA    | 1002 | 92    | 45,48,48     | 0.35 | 0        | 63,73,73    | 0.58 | 1 (1%)   |
| 94  | FES  | AT    | 201  | 73,66 | 0,4,4        | -    | -        | -           |      |          |

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   |
|-----|------|-------|------|-------|---------|------------|---------|
| 93  | VAL  | B     | 101  | 2     | -       | 0/5/6/8    | -       |
| 94  | FES  | I     | 301  | 55,7  | -       | -          | 0/1/1/1 |
| 98  | GDP  | AX    | 503  | -     | -       | 1/16/32/32 | 0/3/3/3 |
| 94  | FES  | AE    | 201  | 58,69 | -       | -          | 0/1/1/1 |
| 97  | ATP  | AX    | 501  | 92    | -       | 0/22/38/38 | 0/3/3/3 |
| 95  | NAD  | AA    | 1002 | 92    | -       | 6/30/62/62 | 0/5/5/5 |
| 94  | FES  | AT    | 201  | 73,66 | -       | -          | 0/1/1/1 |

There are no bond length outliers.

All (2) bond angle outliers are listed below:

| Mol | Chain | Res  | Type | Atoms    | Z     | Observed(°) | Ideal(°) |
|-----|-------|------|------|----------|-------|-------------|----------|
| 95  | AA    | 1002 | NAD  | PN-O3-PA | -2.44 | 124.45      | 132.83   |
| 93  | B     | 101  | VAL  | O-C-CA   | -2.27 | 118.82      | 124.78   |

There are no chirality outliers.

All (7) torsion outliers are listed below:

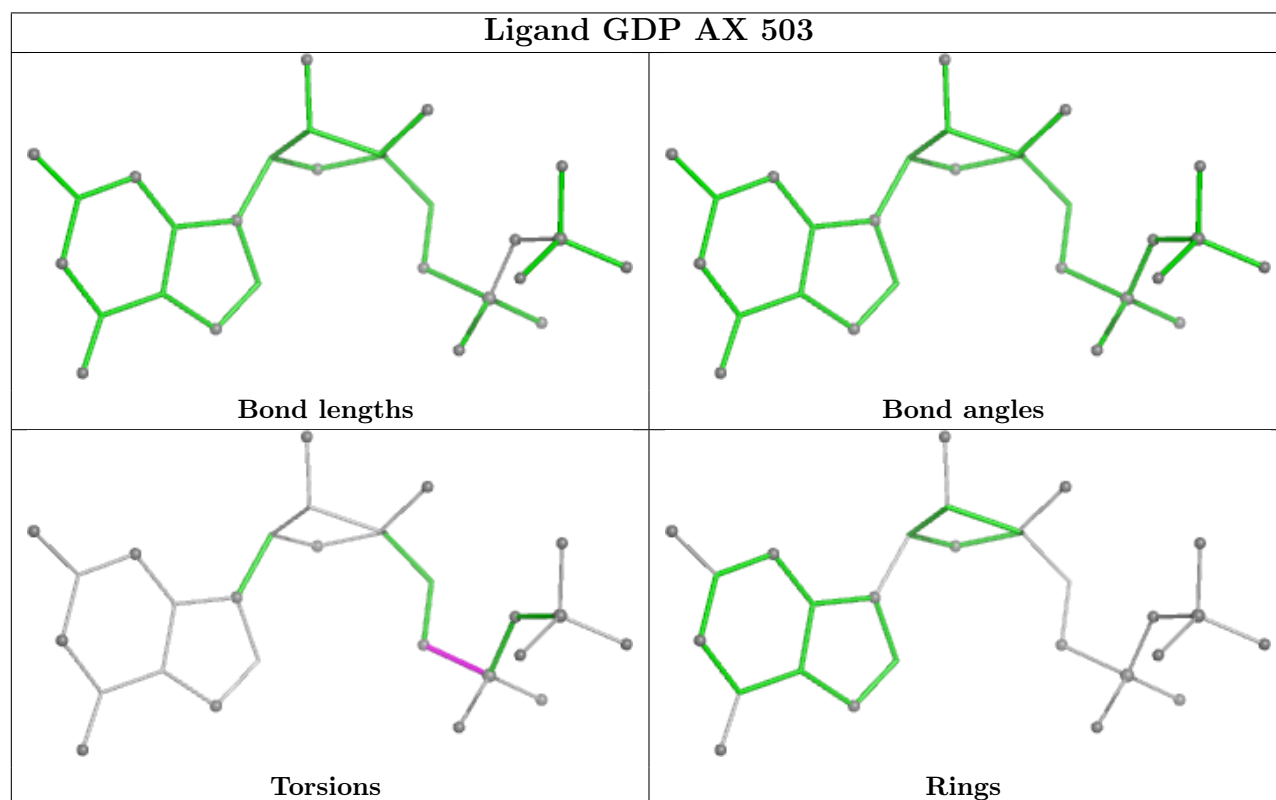
| Mol | Chain | Res  | Type | Atoms           |
|-----|-------|------|------|-----------------|
| 95  | AA    | 1002 | NAD  | C3D-C4D-C5D-O5D |
| 95  | AA    | 1002 | NAD  | O4B-C4B-C5B-O5B |
| 95  | AA    | 1002 | NAD  | O4D-C4D-C5D-O5D |
| 95  | AA    | 1002 | NAD  | C5B-O5B-PA-O3   |
| 95  | AA    | 1002 | NAD  | C2D-C1D-N1N-C2N |
| 95  | AA    | 1002 | NAD  | C3B-C4B-C5B-O5B |
| 98  | AX    | 503  | GDP  | C5'-O5'-PA-O1A  |

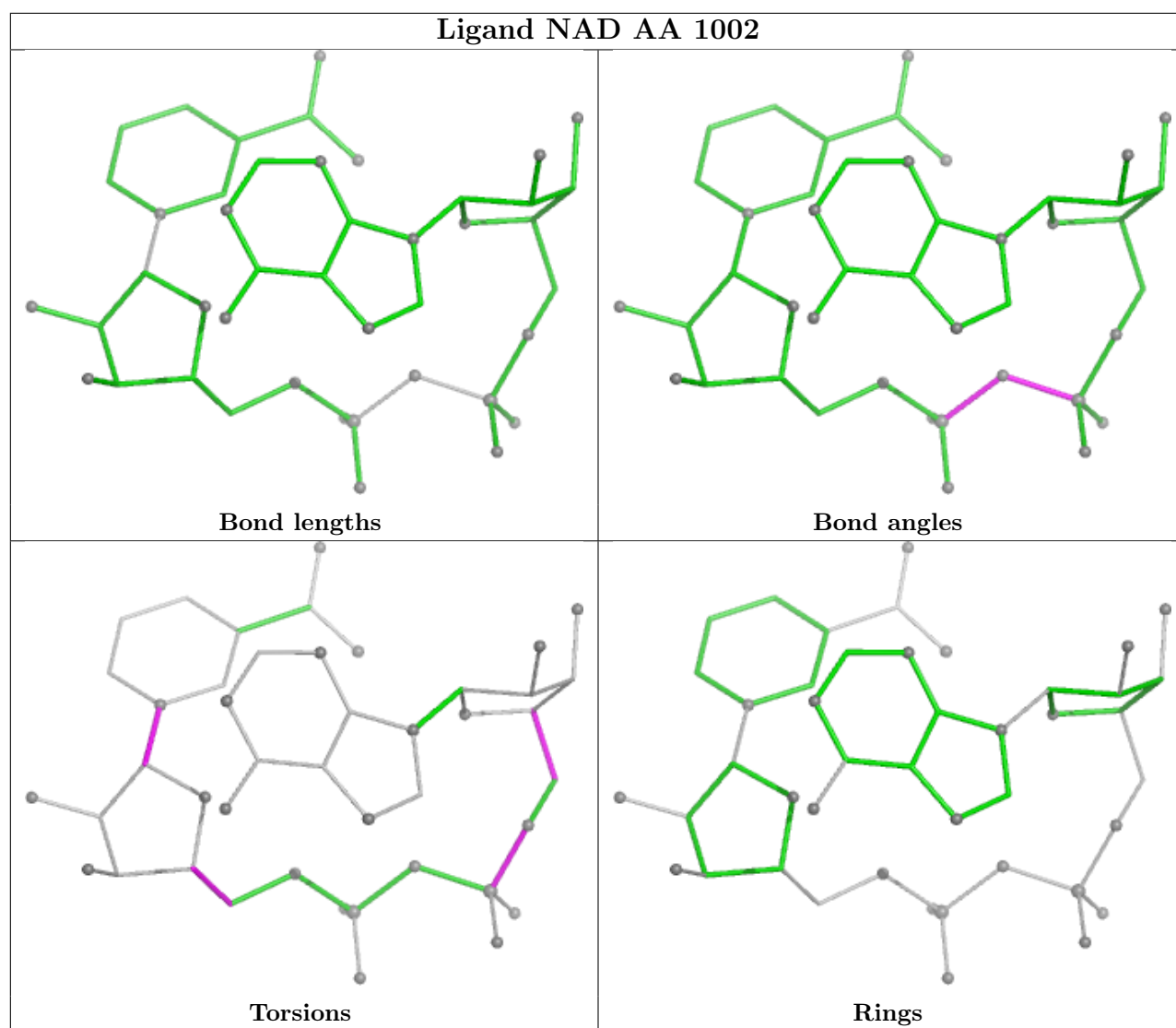
There are no ring outliers.

4 monomers are involved in 9 short contacts:

| Mol | Chain | Res  | Type | Clashes | Symm-Clashes |
|-----|-------|------|------|---------|--------------|
| 93  | B     | 101  | VAL  | 6       | 0            |
| 94  | I     | 301  | FES  | 1       | 0            |
| 97  | AX    | 501  | ATP  | 1       | 0            |
| 95  | AA    | 1002 | NAD  | 1       | 0            |

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





## 5.7 Other polymers [i](#)

There are no such residues in this entry.

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

There are no chain breaks in this entry.

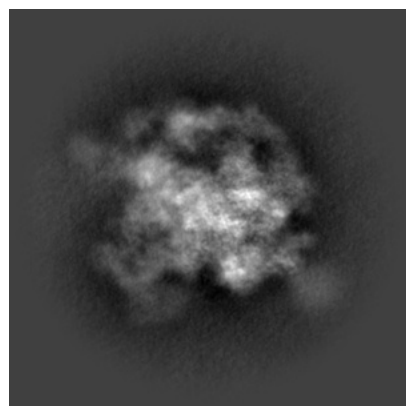
## 6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-54639. These allow visual inspection of the internal detail of the map and identification of artifacts.

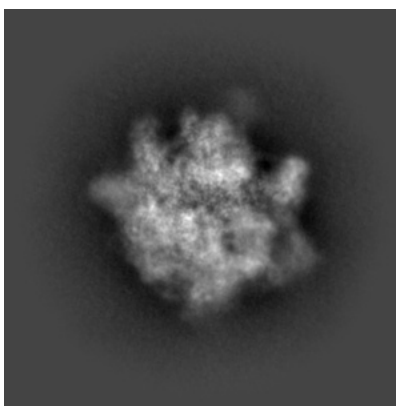
Images derived from a raw map, generated by summing the deposited half-maps, are presented below the corresponding image components of the primary map to allow further visual inspection and comparison with those of the primary map.

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

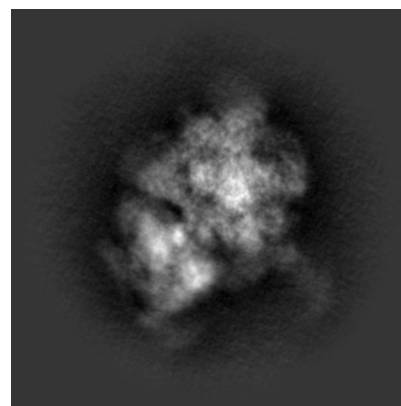
#### 6.1.1 Primary map



X

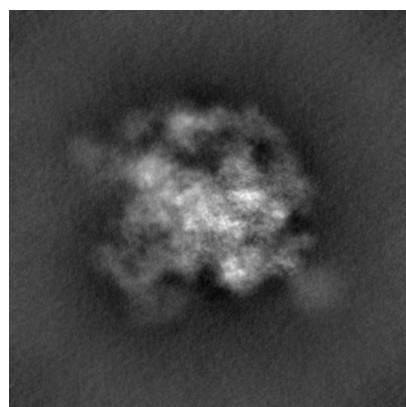


Y

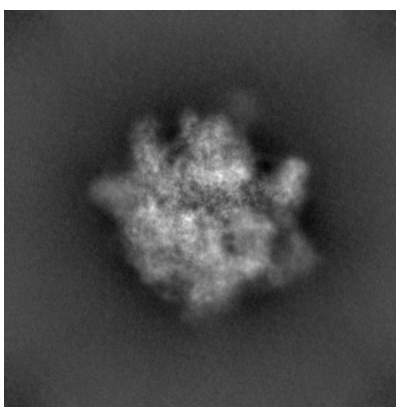


Z

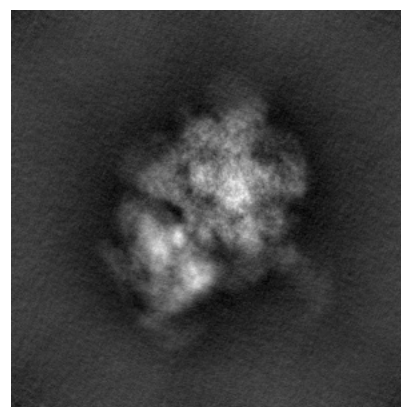
#### 6.1.2 Raw map



X



Y

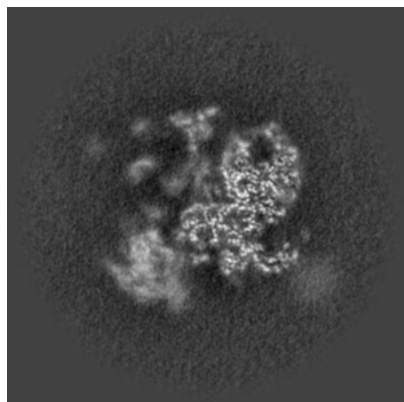


Z

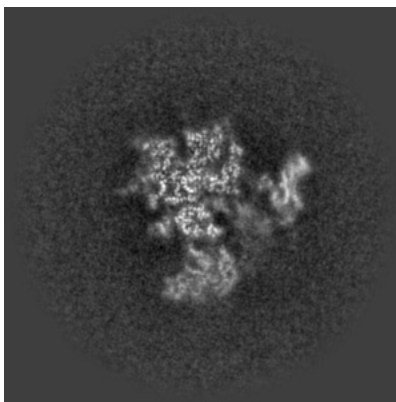
The images above show the map projected in three orthogonal directions.

## 6.2 Central slices [i](#)

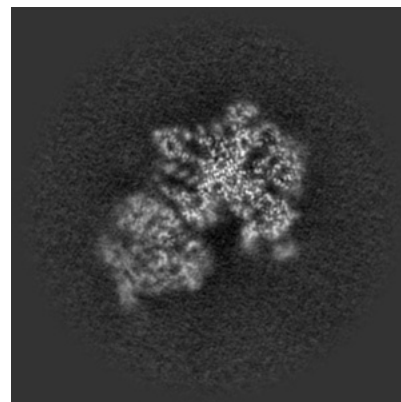
### 6.2.1 Primary map



X Index: 200

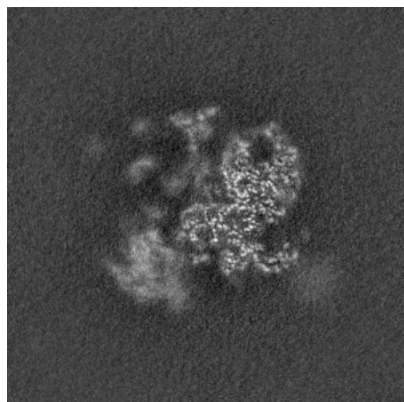


Y Index: 200

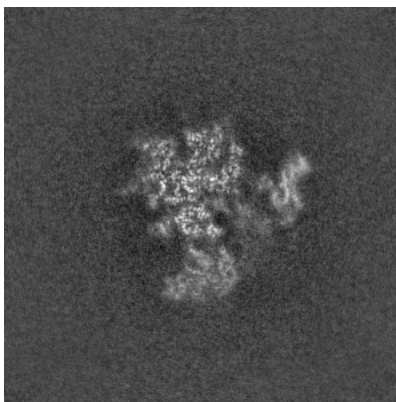


Z Index: 200

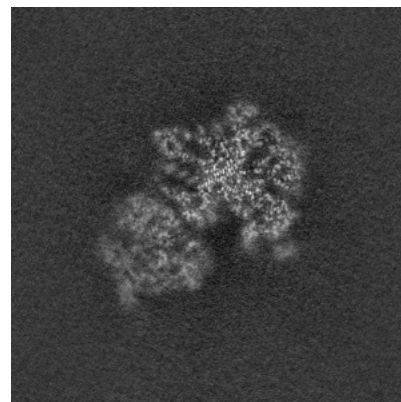
### 6.2.2 Raw map



X Index: 200



Y Index: 200

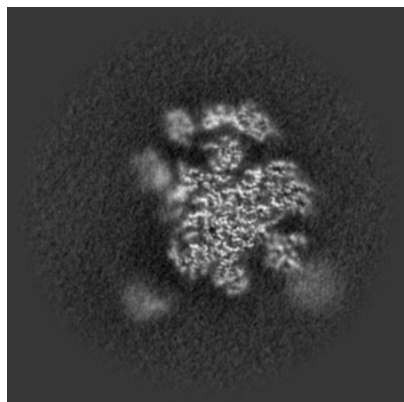


Z Index: 200

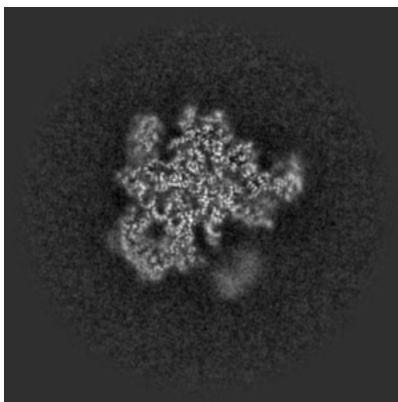
The images above show central slices of the map in three orthogonal directions.

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

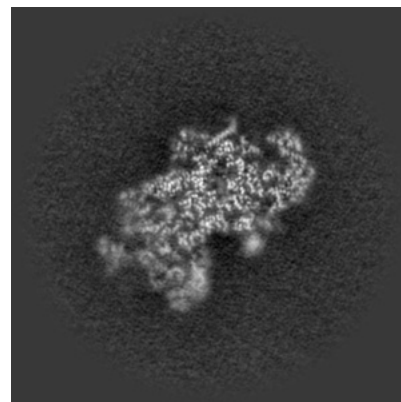
### 6.3.1 Primary map



X Index: 230

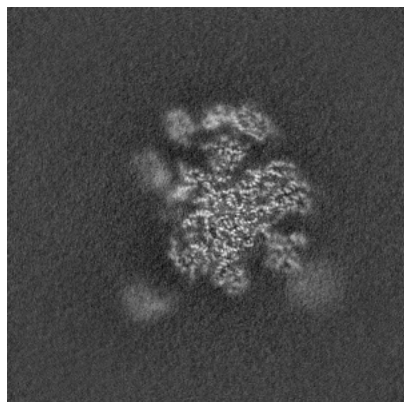


Y Index: 227

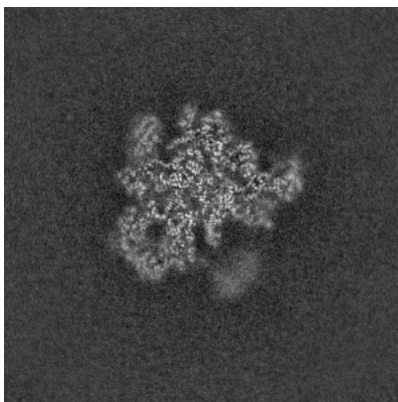


Z Index: 185

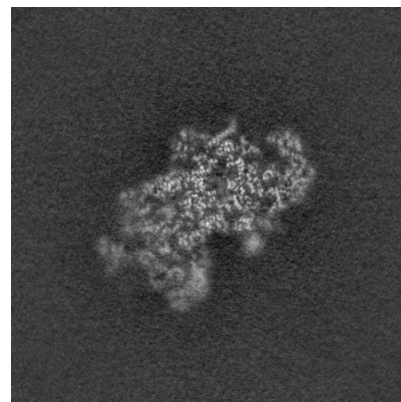
### 6.3.2 Raw map



X Index: 229



Y Index: 228

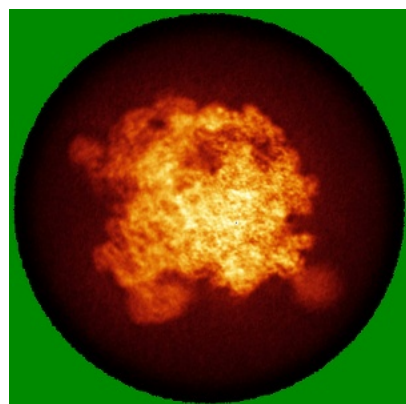


Z Index: 185

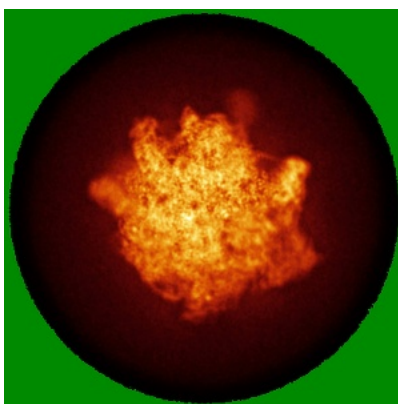
The images above show the largest variance slices of the map in three orthogonal directions.

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

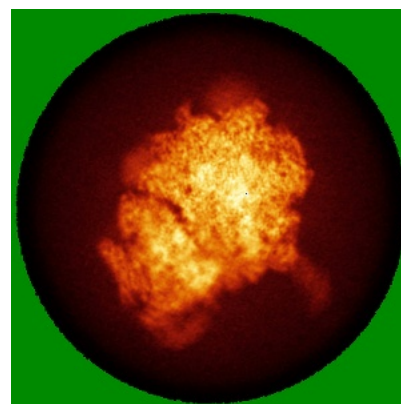
### 6.4.1 Primary map



X

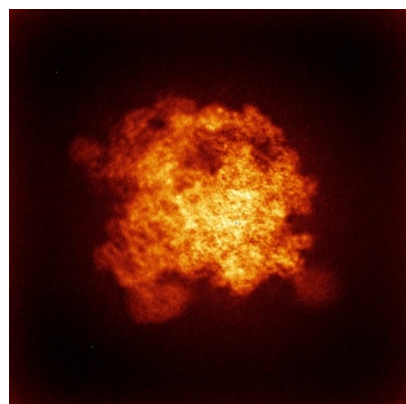


Y

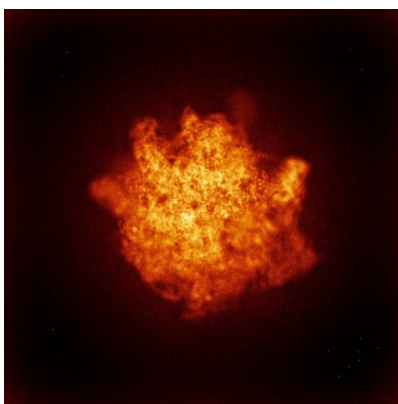


Z

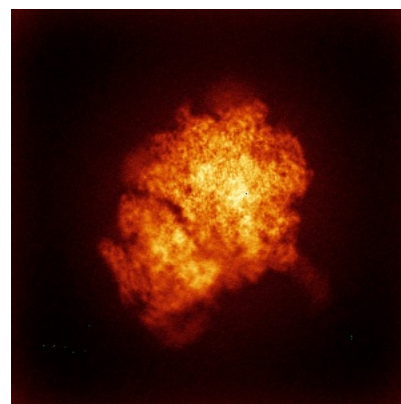
### 6.4.2 Raw map



X



Y

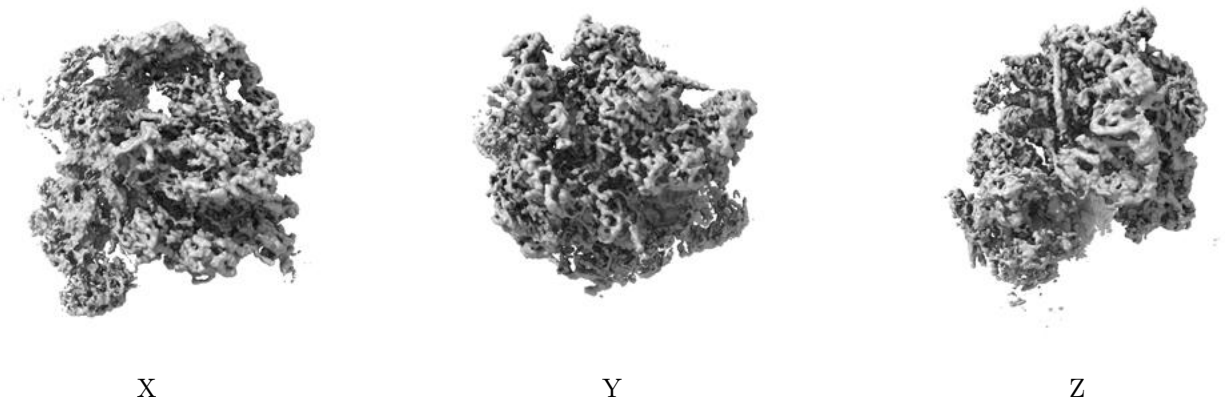


Z

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

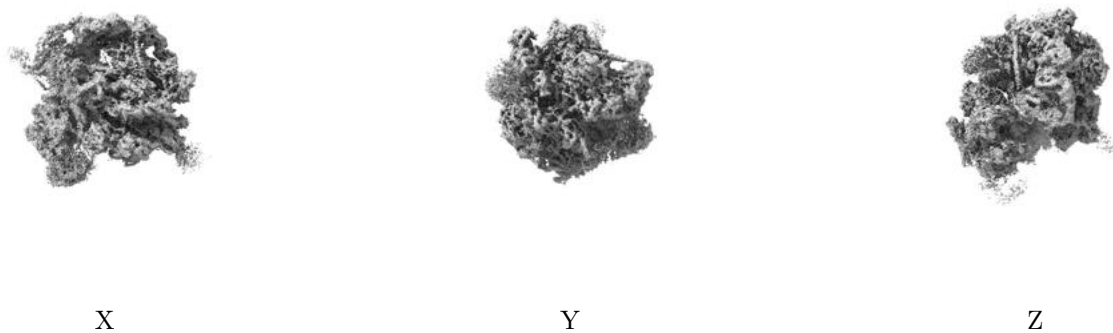
## 6.5 Orthogonal surface views [i](#)

### 6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.7. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

### 6.5.2 Raw map



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

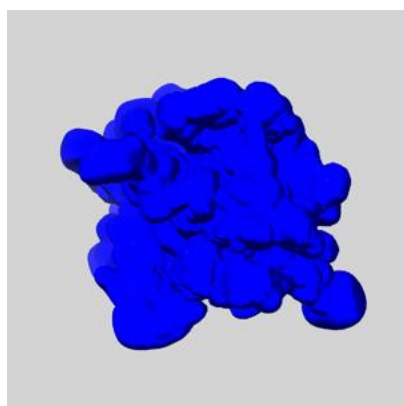
## 6.6 Mask visualisation [i](#)

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

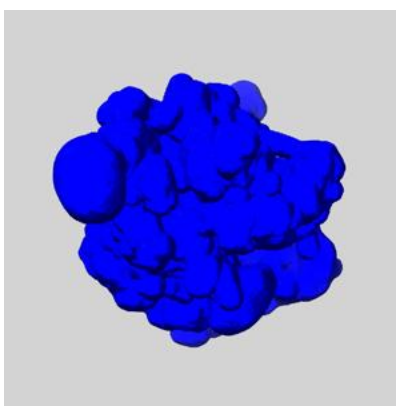
A mask typically either:

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

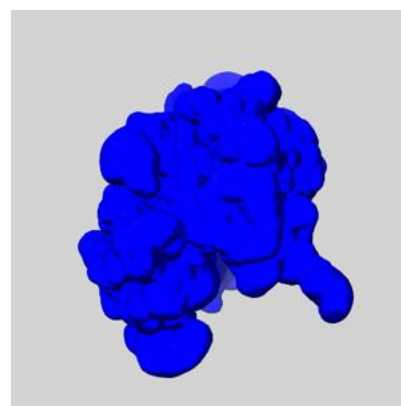
### 6.6.1 emd\_54639\_msk\_1.map [i](#)



X



Y

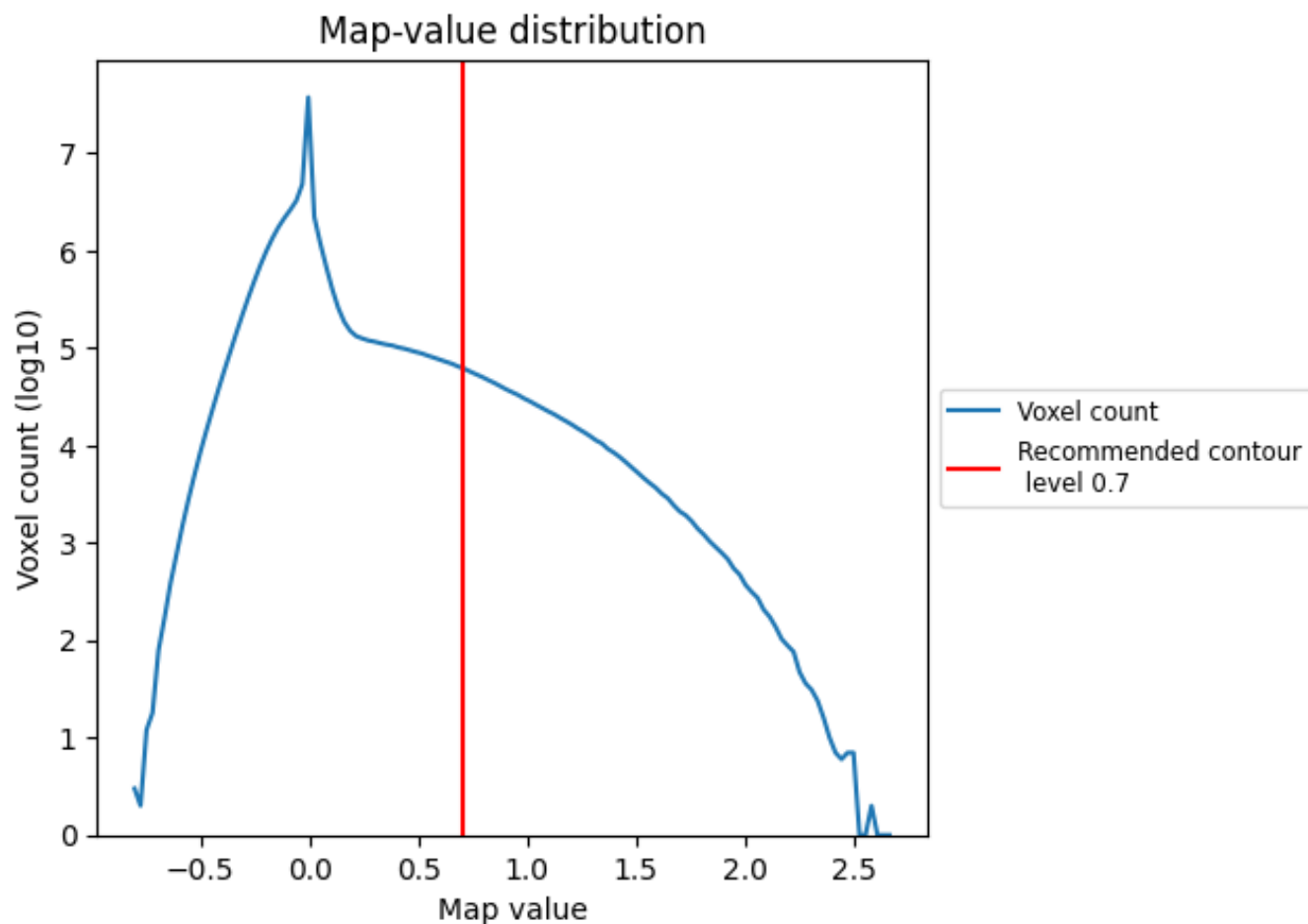


Z

## 7 Map analysis [i](#)

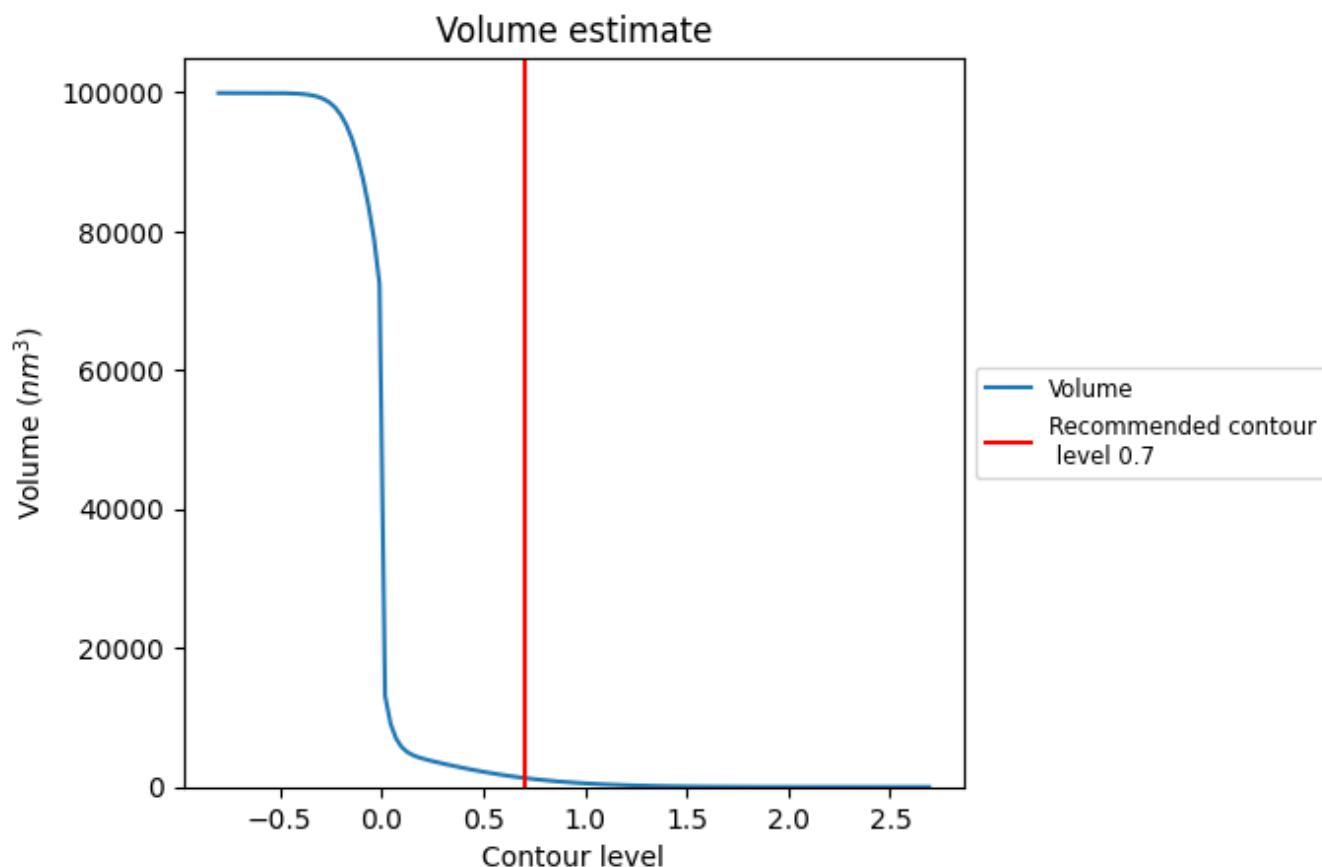
This section contains the results of statistical analysis of the map.

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



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

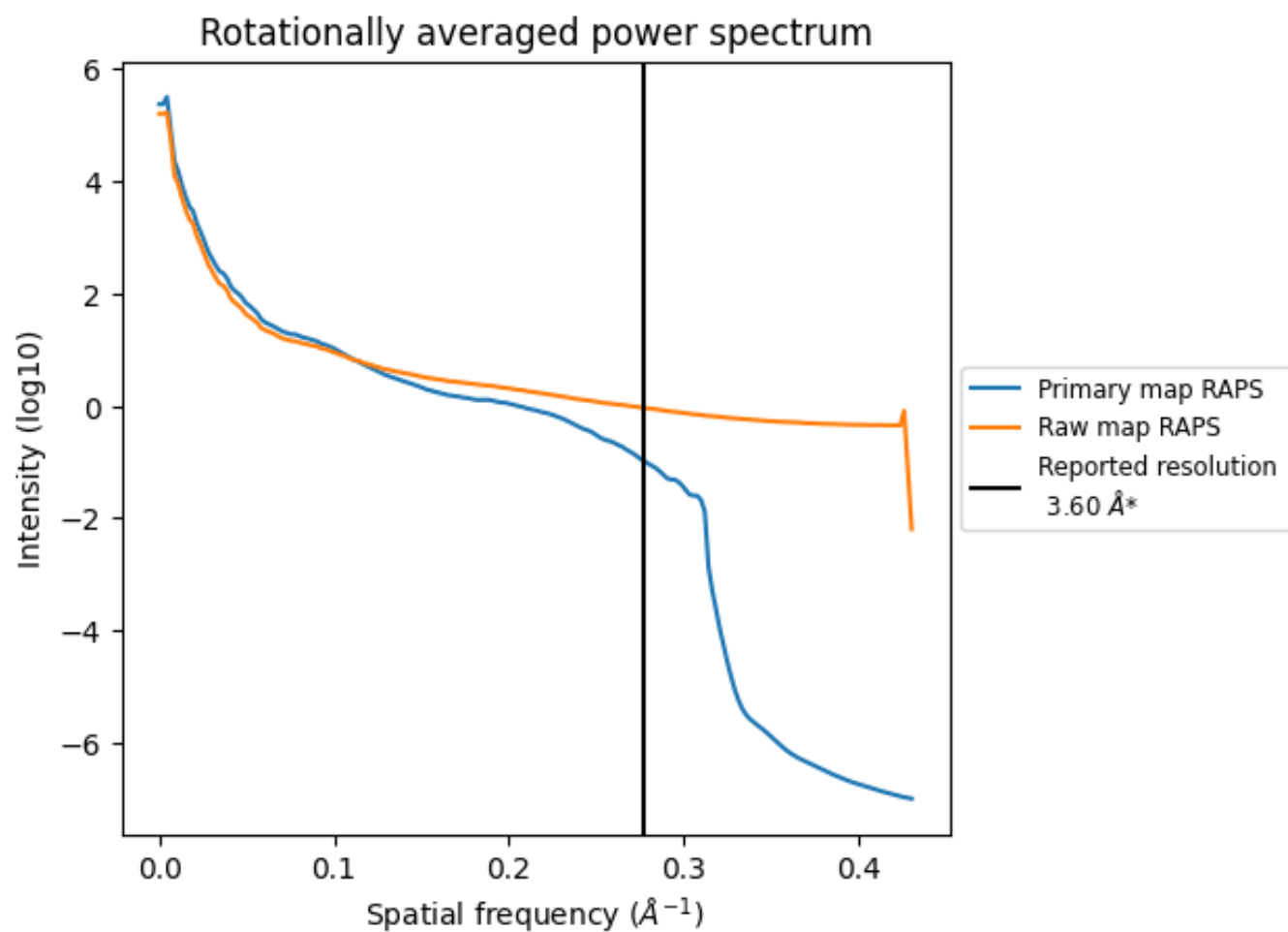
## 7.2 Volume estimate [i](#)



The volume at the recommended contour level is 1298 nm<sup>3</sup>; this corresponds to an approximate mass of 1173 kDa.

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

### 7.3 Rotationally averaged power spectrum ⓘ

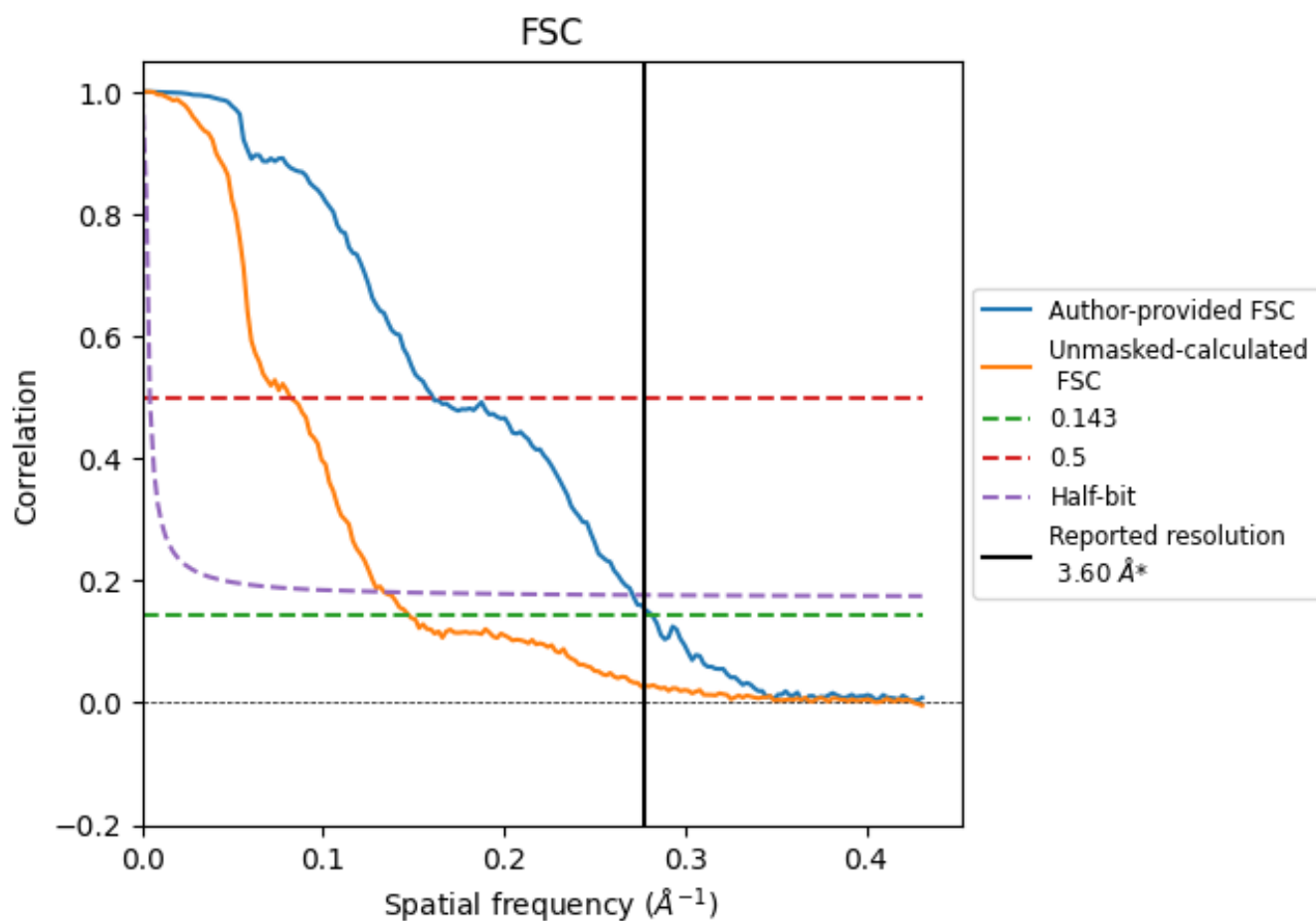


\*Reported resolution corresponds to spatial frequency of  $0.278 \text{ \AA}^{-1}$

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

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

### 8.1 FSC [i](#)



\*Reported resolution corresponds to spatial frequency of 0.278  $\text{\AA}^{-1}$

## 8.2 Resolution estimates [i](#)

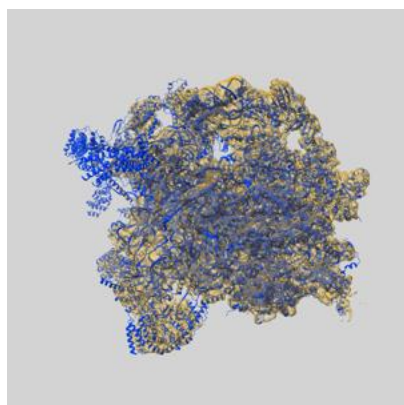
| Resolution estimate (Å)   | Estimation criterion (FSC cut-off) |       |          |
|---------------------------|------------------------------------|-------|----------|
|                           | 0.143                              | 0.5   | Half-bit |
| Reported by author        | 3.60                               | -     | -        |
| Author-provided FSC curve | 3.55                               | 6.23  | 3.69     |
| Unmasked-calculated*      | 6.79                               | 12.22 | 7.49     |

\*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps. The value from deposited half-maps intersecting FSC 0.143 CUT-OFF 6.79 differs from the reported value 3.6 by more than 10 %

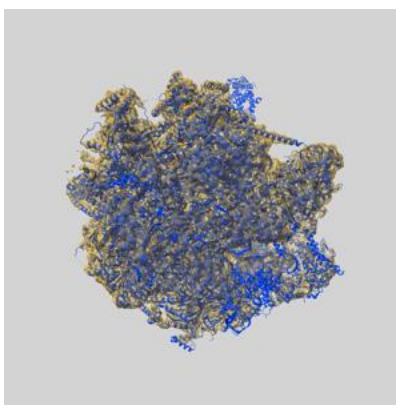
## 9 Map-model fit [i](#)

This section contains information regarding the fit between EMDB map EMD-54639 and PDB model 9S7D. Per-residue inclusion information can be found in section [3](#) on page [26](#).

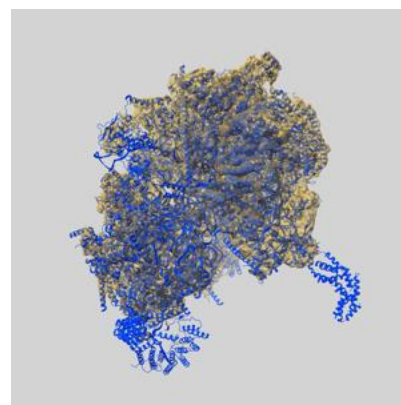
### 9.1 Map-model overlay [i](#)



X



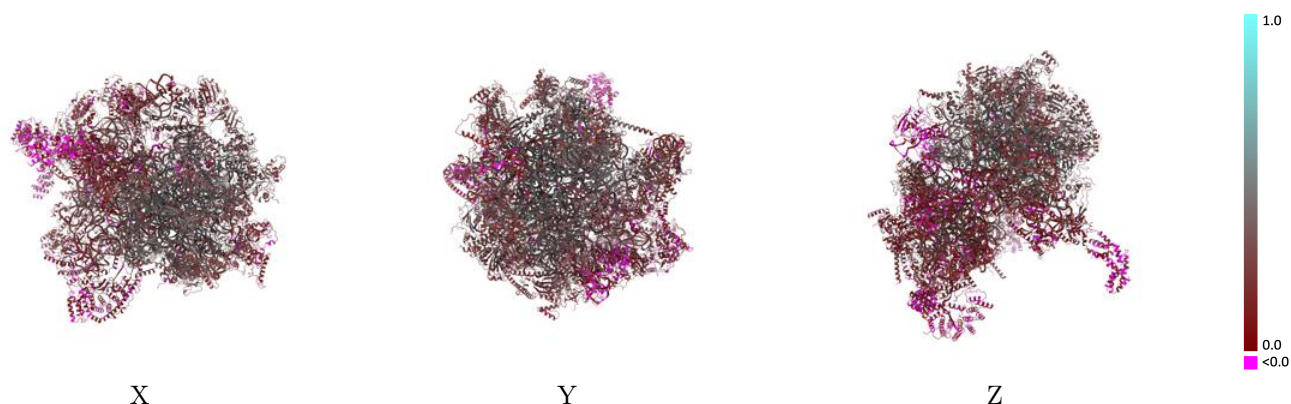
Y



Z

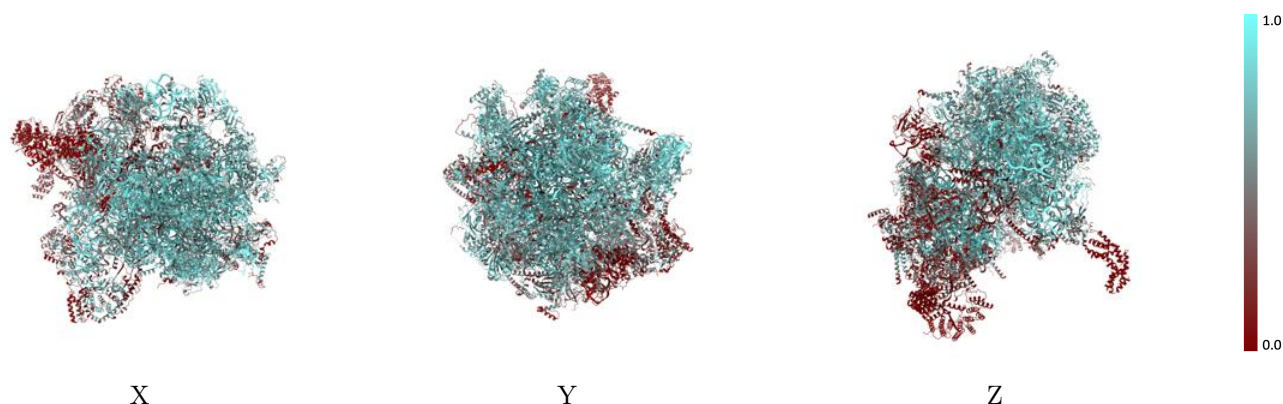
The images above show the 3D surface view of the map at the recommended contour level 0.7 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

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



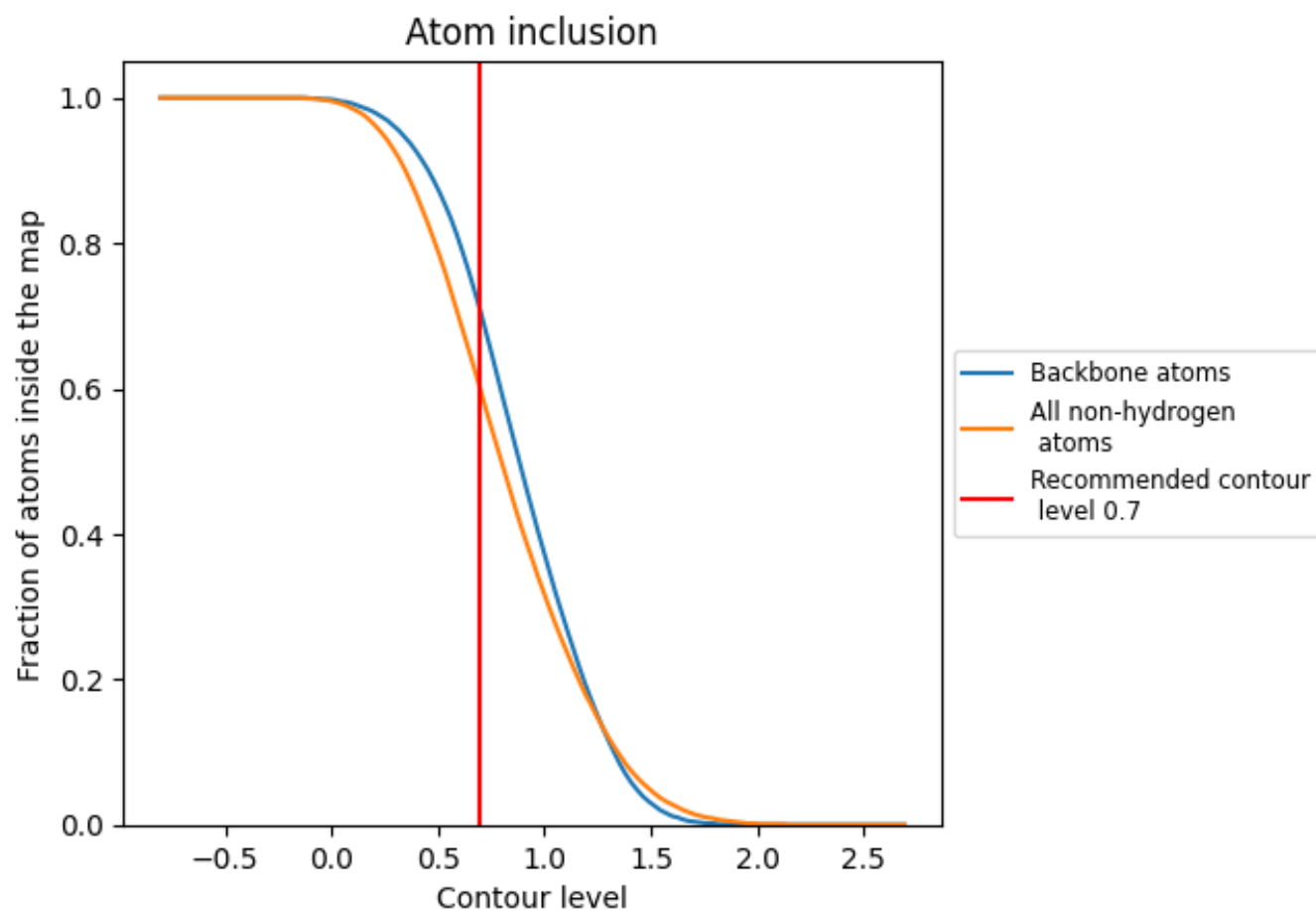
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions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

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



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.7).

## 9.4 Atom inclusion [i](#)



At the recommended contour level, 71% of all backbone atoms, 60% of all non-hydrogen atoms, are inside the map.

## 9.5 Map-model fit summary ⓘ

The table lists the average atom inclusion at the recommended contour level (0.7) and Q-score for the entire model and for each chain.

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| All   |  0.5990   |  0.2770   |
| 0     |  0.6830   |  0.3620   |
| 1     |  0.5880   |  0.2780   |
| 2     |  0.7670   |  0.4340   |
| 3     |  0.7000   |  0.4310   |
| 4     |  0.7490   |  0.3430   |
| 5     |  0.6350   |  0.3080   |
| 6     |  0.7430   |  0.3000   |
| 7     |  0.7180   |  0.3090   |
| 8     |  0.3970   |  0.2140   |
| 9     |  0.6580   |  0.3310   |
| A     |  0.8730   |  0.3840   |
| A0    |  0.4330   |  0.1250   |
| A1    |  0.2330   |  0.1660   |
| A2    |  0.2060  |  0.2340  |
| A3    |  0.4330 |  0.2970 |
| A4    |  0.0270 |  0.0750 |
| AA    |  0.8150 |  0.2780 |
| AB    |  0.5190 |  0.2360 |
| AC    |  0.3060 |  0.2200 |
| AD    |  0.2480 |  0.2300 |
| AE    |  0.4270 |  0.2740 |
| AF    |  0.3680 |  0.1920 |
| AG    |  0.2960 |  0.1880 |
| AH    |  0.2480 |  0.1850 |
| AI    |  0.5460 |  0.2700 |
| AJ    |  0.2050 |  0.2160 |
| AK    |  0.5140 |  0.2100 |
| AL    |  0.4190 |  0.2220 |
| AM    |  0.5120 |  0.1640 |
| AN    |  0.5310 |  0.2340 |
| AO    |  0.3690 |  0.1690 |
| AP    |  0.5680 |  0.2710 |
| AQ    |  0.4910 |  0.2670 |
| AR    |  0.2790 |  0.1570 |



*Continued on next page...*

*Continued from previous page...*

| Chain | Atom inclusion                                                                             | Q-score                                                                                    |
|-------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| AS    |  0.3660   |  0.1860   |
| AT    |  0.3960   |  0.2190   |
| AU    |  0.5360   |  0.1830   |
| AV    |  0.3840   |  0.1010   |
| AW    |  0.3440   |  0.1970   |
| AX    |  0.2810   |  0.1150   |
| AY    |  0.2010   |  0.1360   |
| AZ    |  0.3530   |  0.1770   |
| Au    |  0.0530   |  0.1100   |
| Av    |  0.4470   |  0.3310   |
| Aw    |  0.0330   |  0.1600   |
| Ax    |  0.3970   |  0.1790   |
| Az    |  0.1170   |  0.1130   |
| B     |  0.9090   |  0.2360   |
| D     |  0.7030   |  0.3970   |
| E     |  0.7350   |  0.3820   |
| F     |  0.7100   |  0.3930   |
| H     |  0.3630  |  0.1800  |
| I     |  0.4160 |  0.1750 |
| J     |  0.3460 |  0.1150 |
| K     |  0.7380 |  0.3900 |
| L     |  0.5590 |  0.3840 |
| M     |  0.7290 |  0.3780 |
| N     |  0.6650 |  0.3540 |
| O     |  0.7280 |  0.3840 |
| P     |  0.7750 |  0.3300 |
| Q     |  0.5710 |  0.3480 |
| R     |  0.6560 |  0.3640 |
| S     |  0.6900 |  0.3690 |
| T     |  0.6750 |  0.3960 |
| U     |  0.6280 |  0.3200 |
| V     |  0.4820 |  0.1780 |
| W     |  0.7400 |  0.4110 |
| X     |  0.6500 |  0.3480 |
| Y     |  0.6750 |  0.3330 |
| Z     |  0.5670 |  0.3700 |
| a     |  0.5300 |  0.3060 |
| b     |  0.7010 |  0.3770 |
| c     |  0.6830 |  0.3290 |
| d     |  0.5750 |  0.1980 |
| e     |  0.5990 |  0.1730 |
| f     |  0.4230 |  0.2380 |

*Continued on next page...*

*Continued from previous page...*

| Chain | Atom inclusion                                                                           | Q-score                                                                                   |
|-------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| g     |  0.7080 |  0.3670  |
| h     |  0.6000 |  0.2910  |
| i     |  0.6950 |  0.4130  |
| j     |  0.6400 |  0.3300  |
| k     |  0.5510 |  0.1910  |
| l     |  0.4070 |  0.1420  |
| m     |  0.4100 |  0.1800  |
| o     |  0.7550 |  0.3940  |
| p     |  0.6080 |  0.2840  |
| q     |  0.4890 |  0.2490  |
| r     |  0.7550 |  0.3460  |
| s     |  0.6770 |  0.3390  |
| t     |  0.0110 |  0.0670  |
| u     |  0.0000 |  0.1010  |
| v     |  0.0000 |  0.0410  |
| w     |  0.0000 |  -0.0000 |
| x     |  0.0000 |  0.0110  |
| y     |  0.0000 |  0.0110  |
| z     |  0.0350 |  0.0210  |