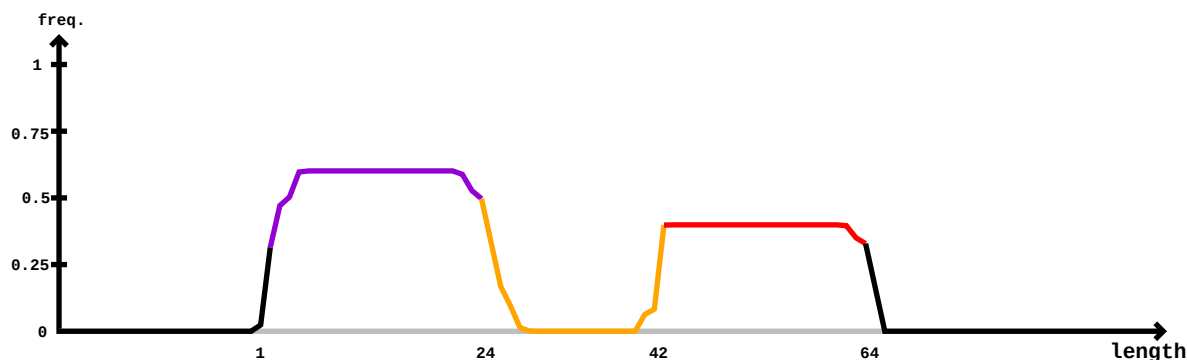


The secondary structure diagram shows the 5' UTR of the hsa-miR-98-3p precursor RNA. The sequence is 5'-G G A C U A C U U U G G A U C A U G U A GAUU-3'. The structure includes a stem-loop at the 5' end, followed by several internal loops and stems, and ends with a poly(U) tail.



## Mature

[illegible]

## Star

## Mature

|                                                                                                              |     |   |     |
|--------------------------------------------------------------------------------------------------------------|-----|---|-----|
| uguuagacgagcagguguccacauacuuuggaucuagauuguguaauguauuuuacaaauacaugaccaaaaguugggacaccgguuggacguacugccaaaacgacg |     |   |     |
| ..... auacuuuggaucuagauugauu .....                                                                           | 2   | 0 | s02 |
| ..... auacuuuggaucuagauug .....                                                                              | 10  | 0 | s02 |
| ..... auacuuuggaucuagauuggu .....                                                                            | 14  | 0 | s02 |
| ..... auacuuuggaucuagauugug .....                                                                            | 2   | 0 | s02 |
| ..... auacuuuggaucuagauugua .....                                                                            | 3   | 1 | s02 |
| ..... auacuuuggaucuagauuggu .....                                                                            | 1   | 1 | s02 |
| ..... uacuu6ggaucuagauug .....                                                                               | 1   | 1 | s02 |
| ..... Aacuuuggaucuagauug .....                                                                               | 1   | 1 | s02 |
| ..... uacuuuggaucuagauug .....                                                                               | 3   | 0 | s02 |
| ..... uacuuuggaucuauuagauug .....                                                                            | 1   | 1 | s02 |
| ..... uacuuuggaucuagauuggu .....                                                                             | 13  | 0 | s02 |
| ..... uacuuuggaucuagauuggu .....                                                                             | 1   | 1 | s02 |
| ..... uacuuuggaucuagauuggu .....                                                                             | 1   | 1 | s02 |
| ..... uacuuuggaucuagauuggu .....                                                                             | 1   | 1 | s02 |
| ..... uacuuuggaucuagauuggu .....                                                                             | 41  | 0 | s02 |
| ..... uacuuuggaucuagauuggu .....                                                                             | 12  | 0 | s02 |
| ..... uacuuuggaucuagauuggu .....                                                                             | 1   | 0 | s02 |
| ..... acuuuggaucuagauuggu .....                                                                              | 5   | 0 | s02 |
| ..... cauacaugaccaaaaguug .....                                                                              | 1   | 0 | s02 |
| ..... cauacaugaccaaaagGuug .....                                                                             | 1   | 1 | s02 |
| ..... cauacaugaccaaaaguug .....                                                                              | 27  | 0 | s02 |
| ..... Aauacaugaccaaaaguug .....                                                                              | 1   | 1 | s02 |
| ..... cauacaugaccaaaaguug .....                                                                              | 9   | 0 | s02 |
| ..... aauacaugaccaaaaguug .....                                                                              | 2   | 0 | s02 |
| ..... aauacaugaccaaaaguug .....                                                                              | 5   | 0 | s02 |
| ..... aauacaugaccaaaaguuggg .....                                                                            | 8   | 0 | s02 |
| ..... aauacaugaccaaaaguugGgg .....                                                                           | 1   | 1 | s02 |
| ..... auacaugaccaaaaguug .....                                                                               | 2   | 0 | s02 |
| ..... auacaugaccaaaaguug .....                                                                               | 2   | 0 | s02 |
| ..... auacaugaccaaaagGuuggg .....                                                                            | 2   | 1 | s02 |
| ..... auacaugaccaaaaguauCugg .....                                                                           | 1   | 1 | s02 |
| ..... auacaugaccaaaaguugCgg .....                                                                            | 1   | 1 | s02 |
| ..... auGcaugaccaaaaguuggg .....                                                                             | 1   | 1 | s02 |
| ..... auacaugaccaaaaguuggg .....                                                                             | 2   | 1 | s02 |
| ..... auacaGgaccaaaaguuggg .....                                                                             | 1   | 1 | s02 |
| ..... auacaugUccaaaaguuggg .....                                                                             | 1   | 1 | s02 |
| ..... auacaugaccCaaaguuggg .....                                                                             | 2   | 1 | s02 |
| ..... auacaugaccaaaaguuggg .....                                                                             | 212 | 0 | s02 |
| ..... auacaugaccaaaaguuggga .....                                                                            | 9   | 0 | s02 |
| ..... auacaugaccaaaagAaugugga .....                                                                          | 1   | 1 | s02 |
| ..... uacaugaccaaaaguuggga .....                                                                             | 1   | 0 | s02 |
| ..... cacauacuuuggaucuagaua .....                                                                            | 6   | 0 | s01 |
| ..... cacauacuuuggaucuagau .....                                                                             | 1   | 0 | s01 |
| ..... cacauacuuuggaucuagauu .....                                                                            | 3   | 0 | s01 |
| ..... acauacuuuggaucuag .....                                                                                | 1   | 0 | s01 |
| ..... acauacuuuggauuagaua .....                                                                              | 1   | 1 | s01 |
| ..... acauacuuuggaucuagaua .....                                                                             | 25  | 0 | s01 |
| ..... acauacuuuggaucuauuaga .....                                                                            | 1   | 1 | s01 |
| ..... acauacuuuggaucuagau .....                                                                              | 15  | 0 | s01 |
| ..... acauacuuuggaucuagCagau .....                                                                           | 1   | 1 | s01 |
| ..... acauacuuuggaucuagauA .....                                                                             | 1   | 1 | s01 |
| ..... acauacuuuggaucuagauu .....                                                                             | 72  | 0 | s01 |
| ..... acauacuuuggaGcaugauu .....                                                                             | 1   | 1 | s01 |
| ..... Gcauacuuuggaucuagauu .....                                                                             | 1   | 1 | s01 |
| ..... acauaUuuuggaucuagauu .....                                                                             | 1   | 1 | s01 |
| ..... acauacuuuggaucuagGgauu .....                                                                           | 1   | 1 | s01 |
| ..... acauacuuuggaucuagGagauug .....                                                                         | 1   | 1 | s01 |
| ..... acauacuuuggaucuagauuU .....                                                                            | 1   | 1 | s01 |
| ..... acauacuuuggaucCuguagauug .....                                                                         | 2   | 1 | s01 |
| ..... acauacuuuggaucuagauuA .....                                                                            | 1   | 1 | s01 |
| ..... acauacuuuggaucuagauug .....                                                                            | 19  | 0 | s01 |
| ..... acauacuuuggaucuauuagauug .....                                                                         | 1   | 1 | s01 |
| ..... acauGcuuuggaucuagauug .....                                                                            | 1   | 1 | s01 |
| ..... acauacuuuggaucuagauug .....                                                                            | 7   | 0 | s01 |
| ..... cauacuuuggaucuag .....                                                                                 | 4   | 0 | s01 |
| ..... cauacuuuggaucuagaua .....                                                                              | 2   | 0 | s01 |
| ..... cauacuuuggaucuagau .....                                                                               | 2   | 0 | s01 |
| ..... cauacuuuggaucuagauA .....                                                                              | 2   | 1 | s01 |
| ..... cauacuuuggGcaugauu .....                                                                               | 1   | 1 | s01 |

## Star

## Mature

|                                                                                                                 |     |   |     |
|-----------------------------------------------------------------------------------------------------------------|-----|---|-----|
| uguuagacgagcagguguccacauacuuuggaucauguagauuguguaauguaauuuacaauacaugaccaaaaguauggacaccggauuggacguacugccaaaacgacg |     |   |     |
| .....cauacuuuggaucauguagauu.....                                                                                | 18  | 0 | s01 |
| .....cauacuuuggaucauguagGuu.....                                                                                | 1   | 1 | s01 |
| .....cauacuuuggaucauguagauuU.....                                                                               | 2   | 1 | s01 |
| .....cauacuuuggaucauguagauug.....                                                                               | 20  | 0 | s01 |
| .....cauacuuuggaGcauguagauug.....                                                                               | 1   | 1 | s01 |
| .....cauacuuuggaucauguagauugu.....                                                                              | 8   | 0 | s01 |
| .....cauacuuuggaucauguagauugA.....                                                                              | 1   | 1 | s01 |
| .....cauacuuuggaucauguagauugug.....                                                                             | 8   | 0 | s01 |
| .....cauacuuuggaucauguagauAgug.....                                                                             | 1   | 1 | s01 |
| .....cauacuuuggaucauguagauugGg.....                                                                             | 1   | 1 | s01 |
| .....auacuuuggaucauguagauu.....                                                                                 | 1   | 0 | s01 |
| .....auacuuuggaucauguagauug.....                                                                                | 1   | 0 | s01 |
| .....auacuuuggaucauguagauugu.....                                                                               | 6   | 0 | s01 |
| .....uacuuuggaucauguagauug.....                                                                                 | 3   | 0 | s01 |
| .....uacuuuggaucauguagauugu.....                                                                                | 5   | 0 | s01 |
| .....uCcuuuggaucauguagauugu.....                                                                                | 1   | 1 | s01 |
| .....uacuuuggaucauguagauugug.....                                                                               | 27  | 0 | s01 |
| .....uacuuuggaucUuguagauugug.....                                                                               | 1   | 1 | s01 |
| .....uacuuuggaucAugauugug.....                                                                                  | 1   | 1 | s01 |
| .....uacuuuggaucauguagauugugu.....                                                                              | 3   | 0 | s01 |
| .....uacuuuggaucuUgauugugu.....                                                                                 | 1   | 1 | s01 |
| .....cauacaugaccaaaaguaugA.....                                                                                 | 1   | 1 | s01 |
| .....cauacaugaccaaaaguaugu.....                                                                                 | 24  | 0 | s01 |
| .....cauacaugaccaaaaguaugug.....                                                                                | 9   | 0 | s01 |
| .....cauacauCaccaaaaguaugugg.....                                                                               | 1   | 1 | s01 |
| .....cauacaugaccaaaaguaugugg.....                                                                               | 3   | 0 | s01 |
| .....cauacaugaccaaaaguaugugU.....                                                                               | 2   | 1 | s01 |
| .....aaucaugaccaaaaguaugug.....                                                                                 | 3   | 0 | s01 |
| .....aaucaugaccaaaaguaugugg.....                                                                                | 5   | 0 | s01 |
| .....aaUGaugaccaaaaguaugugg.....                                                                                | 1   | 1 | s01 |
| .....auacaugaccaaaaguaug.....                                                                                   | 1   | 0 | s01 |
| .....auacGgaccaaaaguaugugg.....                                                                                 | 2   | 1 | s01 |
| .....auacaugaccaaaaguaugugg.....                                                                                | 147 | 0 | s01 |
| .....auacaugaccaaaaguaugugU.....                                                                                | 1   | 1 | s01 |
| .....auacaugacAaaaaguaugugg.....                                                                                | 1   | 1 | s01 |
| .....auacaugaccGaaaaguaugugg.....                                                                               | 1   | 1 | s01 |
| .....auacaugaccaaaagAaugugg.....                                                                                | 1   | 1 | s01 |
| .....auacaugaccCaaaaguaugugg.....                                                                               | 1   | 1 | s01 |
| .....auacGugaccaaaaguaugugg.....                                                                                | 1   | 1 | s01 |
| .....auacaugaccaaaaguaugugga.....                                                                               | 3   | 0 | s01 |