

Revised annotation and characterization of novel *Aedes albopictus* miRNAs and their potential functions in dengue virus infection

ABSTRACT

The Asian tiger mosquito, *Ae. albopictus*, is a highly invasive species that transmits several arboviruses including dengue (DENV), Zika (ZIKV), and chikungunya (CHIKV). Although several studies have identified microRNAs (miRNAs) in *Ae. albopictus*, it is crucial to extend and improve current annotations with both the newly improved genome assembly and the increased number of small RNA-sequencing data. We combined our high-depth sequence data and 26 public datasets to re-annotate *Ae. albopictus* miRNAs and found a total of 72 novel mature miRNAs. We discovered that the expression of novel miRNAs was lower than known miRNAs. Furthermore, compared to known miRNAs, novel miRNAs are prone to expression in a stage-specific manner. Upon DENV infection, a total of 44 novel miRNAs were differentially expressed, and target prediction analysis revealed that miRNA-target genes were involved in lipid metabolism and protein processing in endoplasmic reticulum. Taken together, the miRNA annotation profile provided here is the most comprehensive to date. We believed that this would facilitate future research in understanding virus–host interactions, particularly in the role of miRNAs.