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A POSSIBLE ROLE FOR THE MICRORNA-276 GENE DUPLICATION IN SPECIFYING SEX-RELATED NEURONAL FUNCTIONS

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MicroRNAs (miRNAs) are short, non-coding, pleiotropic RNAs, which play a role in post-transcriptional regulation of protein coding genes. Genomic data suggest that novel miRNA genes often evolve via genomic duplication events. However, the phenotypic significance of most miRNA gene duplications are still unknown. One example is the miR-276 gene, which is represented by a single copy in most arthropod genomes. However, a gene duplication found in *Drosophila* and other muscomorpha genomes (e.g., the house fly) has resulted in two *miR-276* paralogs, an ancestral *miR-276a* and a derived *miR-276b*, which differ by only a single nucleotide. I tested the hypothesis that the *miR-276* gene duplication plays a functional role via the regulation of novel genetic networks. To test the hypothesis, I utilized a combination of genetic, imaging, and behavioral approaches in *Drosophila* to determine whether the two *miR-276* genes play independent roles in regulating neuronal and behavioral phenotypes. Insights gained from our studies have the potential to uncover an explanation for why some miRNA gene duplications have been retained in certain phylogenetic clades, and the role these duplications play in the emergence of novel phenotypes.