Insights: Publications

The role of trophoblastic microRNAs in placental viral infection

The International Journal of Developmental Biology

JULY 10, 2014 Written by Avraham Bayer, Ph.D.

During the past decade, various types of small non-coding RNAs were found to be expressed in all kingdoms and phyla of life. Intense research efforts have begun to shed light on their biological functions, although much remains to be determined in order to fully characterize their scope of biological action. Typically, small RNAs provide sequence specificity to a protein complex that is driven to silence a long target RNA. MicroRNAs (miRNAs) are small RNAs that are coded in the genome of most eukaryotes, and contribute to the cellular identity by regulating cell-specific gene networks by translational repression or degradation of mRNA. These effects commonly fine-tune gene expression associated with developmental or environmental cues. Different cell types can be characterized by their distinctive cellular miRNA landscape. The human placenta expresses a unique set of miRNAs, a high proportion of which is derived from a large cluster located on chromosome 19, (termed chromosome 19 miRNA cluster, or C19MC). Interestingly, a fraction of these placenta-enriched miRNAs are released to the extracellular environment through exosomes that were recently found to induce an antiviral immunity. In this review, we explore relevant placental viral infections and discuss the antiviral role of exosome-packaged placental C19MC miRNAs in this context.

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