

Insights: Publications

The Function of TrophomiRs and Other MicroRNAs in the Human Placenta

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In eutherian organisms, the placenta interfaces the fetal and maternal environments. Located at the placental villous surface, in direct contact with maternal blood, is the trophoblast layer, which mediates the crucial maternal–fetal exchange of gases, nutrients, and waste products, produces hormones that support the pregnancy, and provides immunologic defense. Discovery of microRNAs (miRNAs) and their role in development, differentiation, and homeostatic resilience has increased our understanding of genomic and epigenomic networks that regulate placental function. Moreover, unique miRNA species, which are expressed by human trophoblasts and are termed “trophomiRs,” may show specialized functions during normal and pathological pregnancies. Placental miRNAs, packaged within exosomes and other vesicles or bound in protein complexes, are capable of communicating distinctive signals to maternal and/or fetal tissues. Additional research may usher in the use of circulating miRNAs as pregnancy-related disease biomarkers, providing new diagnostic and therapeutic options during pregnancy.

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