



**19th International Conference on New Findings
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**The Role of Placental-Derived Exosomes in Feto-Maternal
Communication and Their Potential as Diagnostic
Biomarkers in Pregnancy Complications**

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The placenta serves as a complex endocrine and metabolic hub, facilitating a sophisticated bidirectional communication network between the fetus and the mother. Central to this interaction are exosomes—small extracellular vesicles that transport proteins, lipids, and nucleic acids. Emerging evidence suggests that placental exosomes play a critical role in modulating the maternal immune response, ensuring fetal tolerance, and regulating the remodeling of maternal spiral arteries. Dysfunction in the secretion or cargo of these exosomes is closely linked to the pathogenesis of severe pregnancy complications, most notably preeclampsia and fetal growth restriction (FGR). The altered expression of placental exosomal miRNAs and proteins can trigger systemic maternal inflammation and endothelial dysfunction. By examining the molecular signature of circulating exosomes in maternal blood, there is a promising opportunity to develop non-invasive, early-diagnostic tools for predicting adverse pregnancy outcomes before clinical symptoms manifest.



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Furthermore, the potential of utilizing engineered exosomes for the targeted delivery of therapeutic agents to the feto-placental unit is discussed, offering a new frontier in treating placental insufficiencies. Integrating these molecular insights into the clinical framework of obstetrics and gynecology allows for a deeper understanding of the maternal-fetal interface. This review concludes that targeting the exosomal pathway not only advances our fundamental knowledge of reproductive biology but also provides a scalable strategy for personalized prenatal care and the mitigation of high-risk pregnancy risks.

Keywords: Placenta, Exosome, Pregnancy, Preeclampsia
Non-invasive diagnostics.

References

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