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## ABSTRACT

Endometriosis, the deposition of ectopic endometrial tissue in the peritoneal cavity, is an enigmatic, benign, estrogen dependent disease coupled with infertility and pain. The symptoms of endometriosis generally include dysmenorrhea, infertility, irregular menses, and pain with intercourse, bowel movements and /or urination. When subjected to ovarian hormones, endometriosis lesions have the same effect as normal endometrium, capable of superficial invasion, with proliferation of new blood vessels around the lesions and development of inflammatory responses. Endometriosis affects 15 – 20% of women within the United States and is a chronic inflammatory disorder. There is currently no cure and the most effective approach to management is through early diagnosis with treatment of pain and fertility related disorders. The objective of this study was to gain a better understanding of the pathophysiology of Endometriosis by confirming the presence of membrane-bound vesicles, exosomes, which act as mediators of intercellular communication. It is believed that exosomes function as intercellular messengers, likely through the exchange of miRNAs, mRNAs, and proteins. Exosomes are small vesicles (30 – 150 nm in diameter) containing unique mRNAs, other non – coding RNAs, and proteins that are secreted by a variety of cell types. We developed and optimized protocols for the isolation of exosomes from cells in culture from healthy and endometriosis patients. Then we sought to verify that these exosomes contained miRNA and determine if there was differential expression of miRNA in exosomes from healthy subjects than those from subjects with endometriosis.

Mature miRNAs are short, non-coding RNAs that play key roles in the regulation of gene expression at the post – transcriptional level. Mature miRNAs are involved in a wide range of biological processes such as cell cycle control, apoptosis and angiogenesis. We isolated miRNA from exosomes. Deep sequencing revealed differential expression levels of miR-21 and miR-126 in case and control exosomes, and was confirmed by real – time PCR.

**Keywords**: endometriosis, ectopic, exosome, eutopic, miRNA

*I do not want to embargo.