# Genetic variations in UCA1, a lncRNA functioning as a miRNA sponge, determine endometriosis development and the potential associated infertility via regulating lipogenesis

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## Abstract

Endometriosis is a hormone-associated disease which has been considered as the precursor for certain types of ovarian cancer. In recent years, emerging evidence demonstrated potent roles of lncRNA in regulating cancer development. Since endometriosis shares several features with cancer, we investigated the possible involvement of cancer-related lncRNAs in endometriosis, including UCA1, GAS5 and PTENP1. By using massARRAY system, we investigated certain genetic variations in cancer-related lncRNAs that can change the thermo-stability, leading to up-regulation or down-regulation of those lncRNAs. Our data indicated three risk genetic haplotypes in UCA1 which can stabilize the RNA structure and increase the susceptibility of endometriosis. Of note, such alterations were found to be associated with long-term pain and infertility in patients. It has been known that UCA1 can function as a ceRNA to sponge and inhibit miRNAs, resulting in loss-of-control on downstream target genes. Gene network analyses revealed fatty acid metabolism and mitochondria beta-oxidation as the major pathways associated with altered UCA1 expression in endometriosis patients. Our study thus provides evidence to highlight functional/epigenetic roles of UCA1 in endometriosis development via regulating fatty acid metabolism in women.