LOC100506691, a long noncoding RNA, acts as novel oncogene in regulating breast cancer growth

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**Purpose**

Long non-coding RNAs (LncRNAs), which are noncoding transcripts over 200 nucleotides in length, have recently emerged as significant molecules in human cancer progression. This study aims to investigate the role of LOC100506691 in the regulation of cell growth in breast cancer.

**Materials and Methods**

This study identified 73 metastasis-related lncRNA candidates from comparison of paired isogenic high and low human metastatic breast cancer cell lines, and their expression levels were verified in clinical tumor samples by using The Cancer Genome Atlas.

**Results**

Analysis of the TCGA database reveals that LOC100506691 is highly expressed in breast cancer. Moreover, high expression levels of LOC100506691 are significantly associated with poor prognosis in breast cancer patients. Functional assays indicate that LOC100506691 contributes to breast cancer cell growth by impairing cell cycle progression. Additionally, LOC100506691 regulates several in vitro metastatic traits such as cell migration and invasion. Using the CRISPR approach, we demonstrated that the knockout of LOC100506691 can suppress the tumor growth potential of breast cancer cells in a mouse model. Further, we showed that LOC100506691 influences breast cancer growth through the modulation of PI3K/AKT signaling activation.

**Conclusion**

Our study demonstrates that LOC100506691 plays a role in breast cancer growth, highlighting its potential as a molecular biomarker for cancer diagnosis and as a therapeutic target for breast cancer.