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Long non coding RNAs effect cancer cell invasion by epigenetic alterations

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Long non-coding RNA (lncRNA) is a subgroup of non-coding RNAs and lncRNAs can regulate gene expression. LncRNAs have different lengths (≥200 bp). There is limited information about these lncRNAs. Recent studies showed that they play crucial roles during carcinogenesis. LncRNAs regulate gene expression by Polycomb Repressive Complex 2 (PRC2) in various biological processes, such as cell motility, cell proliferation, cell differentiation and cell invasion. PRC2 is composed of enhancer of zeste homolog 2 (EZH2), suppressor of zetse 12 (SUZ12) and embryonic ectoderm development (Eed) and catalyzes H3K27 trimethylation (H3K27me3). EZH2 is the catalytic component of PRC2 and is frequently overexpressed in human cancers. Some lncRNAs, such as MALAT1, HOTAIR, TUG1, LINC01133 epigenetically regulate gene expression through binding to PRC2 during carcinogenesis. MALAT1 can bind with EZH2 and this interaction promotes gastric cancer cellular migration and invasion. Also MALAT1 promotes osteosarcoma metastasis through interacting with EZH2. HOTAIR interacts with PRC2 and induces breast cancer cell invasion. On the other hand TUG1 could affect cell proliferation by binding to PRC2 in human non-small cell lung cancer and TUG1 positively correlated with gastric cancer invasion. Knockdown of LINC01133 in non-small cell lung cancer cells decreased cell migration and invasion by interacting with PRC2. Carcinogenesis is a very complex phenomenon and is highly affected by epigenetic modifications. Cell invasion is the most common process for cancer development. It is reported that lncRNAs can interact with PRC2 and they can induce cell invasion through epigenetic alterations. We suggest that these lncRNAs can be used for inhibition of cancer cell invasion and thus, they can provide new alternatives to cancer treatment.

Biography

Emine Kandemiş has completed her B.Sc. at Haliç University, Department of Molecular Biology and Genetics and had her Master's and PhD degrees at Dokuz Eylül University, Department of Medical Biology and Genetics. He is a Faculty Member at Bahçeşehir University, Department of Molecular Biology and Genetics since 2017. His research mainly focuses on cancer, stem cells and lncRNAs.

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