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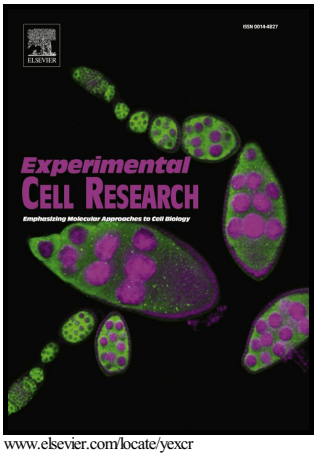

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SIRT1 and microRNAs: the role in breast, lung and prostate cancers

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ABSTRACT

Breast cancer and prostate cancer are the most common malignant tumors in female and men, respectively. Furthermore, lung cancer is the leading cause of cancer deaths worldwide. It is an emergency to develop a powerful strategy to treat these threatening cancers more effectively, because of low efficacy and high rates of chemotherapy effects. MicroRNAs (miRNAs), a class of small non-coding RNAs, are key regulators of gene expression via induction of translational repression or mRNA degradation. MiRNA deregulation has been linked to cancer initiation and progression. Silent Inflammation Regulator 2 (SIR2) proteins-sirtuins- are a family of histone deacetylases (HDACs) that catalyze deacetylation of both histone and non-histone lysine residues. SIRT1 can act as an oncogene. It plays a role in tumorigenesis by anti-apoptotic activity and is implicated in diverse cellular process including autophagy, senescence, apoptosis, proliferation, and aging. MicroRNAs and SIRT1 serve as tumor suppressors or tumor promotors depending on the oncogenic pathway specific to particular tumors. MicroRNAs modulate cancer development by targeting SIRT1. In this review, we underlie the specific mechanisms involved in these threatening cancers by microRNAs/SIRT1 pathways.