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Novel Anticancer Drug 5H-pyro[3,2-a] Phenoxazin-5-one (PPH) Regulates lncRNA HOTAIR and HOXC genes in Human MCF-7 Cells

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Breast cancer in women is the second most commonly cancer, after skin cancer. The percentage of mortality risk for breast cancer is 1 in 37 women (2.7%), which makes breast cancer represent the second cause of cancer death in women. Recently, new research based on previously published work in systemic chemotherapy and endocrine therapy field, have improved the incidence rates. The quinonic nucleus is common to many natural and synthetic products associated with anticancer and antibacterial activities, these compounds are typically DNA-intercalating agents. The Class I Homeobox genes (HOX in human and hox in mouse) control embryonic development and specific determination of positional identity anteroposterior axis of the human body. The HOX genes, are 39 transcription factors related to morphological, physiological disease. It has been demonstrated that any deregulation into the network is able to induce neoplastic transformation. Particularly, HOXC locus collaborating with lncRNA HOTAIR play a key role in breast cancer.

In this study, our group evaluated the chemical and metabolic stability of new anticancer molecule 5H-pyro[3,2-a] phenoxazin-5-one (PPH). In a recent paper, we have already demonstrated that a new and potent anticancer synthetic iminoquinone, the 5H-pyrido[3,2-a]phenoxazin-5-one (PPH), is able to inhibit a large number of lymphoblastoid and solid-tumor-derived cells at submicromolar concentrations.

Based on our previous research, we decided to analyze the cytotoxic effect and capability of PPH to control the lncRNA HOTAIR and HOXC locus gene expression in human breast cancer cells MCF-7, in order to demonstrate its role like potential new breast cancer antitumor drug.

Key words: HOX, HOTAIR, cancer, drug

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