3. COMBINED ADMINISTRATION OF DOCETAXEL AND APIGENIN INHIBITS BREAST CANCER CELL SURVIVAL AND MIGRATION

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Introduction. Breast cancer, an urgent global health issue, necessitates innovative therapeutic approaches. This study focuses on HER2-positive breast cancer characterized by overexpression of the HER2 gene. Apigenin, a natural flavonoid, has been reported to potentially act as a chemosensitizer in certain types of cancer. However, its role in the treatment of HER2-positive breast cancer remains unknown.

Aim of study. The aim of the study was to determine the potential synergistic anti-proliferative and anti-migratory effects of docetaxel, a commonly used chemotherapeutic agent, and apigenin on the progression of SKBR3 breast cancer cells.

Methods and materials. SKBR3 cells were treated with various concentrations of docetaxel, apigenin, and their combinations. Cell viability, apoptosis and migration were assessed using the MTT test, imaging techniques, Hoechst staining and wound healing assays, respectively.

Results. Over a 72-hour incubation, apigenin demonstrates significant, dose-dependent inhibition of SKBR3 breast cancer cells. Co-administration of 12.5 µM apigenin and 3 nM docetaxel notably amplifies cell death induction compared to individual treatments ($p<0.01$). The mechanism of cell death was identified to be apoptosis. Furthermore, the combined treatment strategies exhibit more effective inhibition of cell migration compared to docetaxel alone ($p<0.05$).

Conclusion. Cancer cells can spread to different tissues, forming secondary tumor foci. Cells in these tissues being resistant to treatment can increase the risk of death. Therefore, preventing metastasis through treatments is desirable. Our study demonstrates that the combination treatment of apigenin increases cell death and significantly suppresses migration, potentially reducing the risk of metastasis compared to single docetaxel application. The observed synergistic effects of docetaxel and apigenin offer a promising avenue for clinical research, presenting potential therapeutic strategies for HER2-positive breast cancer.

Keywords. Apigenin, Docetaxel, HER2 positive, Breast cancer, Cell Migration