The Nature Compound Taiwanin E Inhibits The Cell Migration In Human Lovo Colon Cancer Cells Through The COX-2/EGFR/MAPK Pathway Suppression

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Colorectal cancers with nonhereditary and hereditary types are the most prevalent cancers. Hereditary colon cancers include familial adenomatous polyposis (FAP) and hereditary non-polyposis colon cancer (HNPCC). LoVo colorectal cancer cell line from HNPCC patients was tested in this study. Taiwanin E, a lignan isolated from Taiwania cryptomerioides Hayata, was previously reported to have cytotoxicity against human cancer cells. Cyclooxygenase-2 (COX-2) and the epidermal growth factor receptor (EGFR) were discovered as a highly relationship regulated the development in cancers. Here, we tested human LoVo colon cancer cells with Taiwanin E, and the treatments decreased COX-2 and p-Tyr1068 EGFR protein levels indeed. Taiwanin E treatments also can decrease the activation of protein kinase A (PKA), protein kinase B (Akt), extracellular regulated protein kinases (ERK) and p38 MAPK. In Taiwanin E -treated cells, the expression of β-catenin is decreased and Glycogen synthase kinase-3β (GSK-3β) expression is increased in a dose-dependent manner. Moreover, the immunofluorescence microscopy pictures shown that the β-catenin translocate into nuclear by Taiwanin E treatments. At the same time, Taiwanin E significantly inhibited cell migration and migration-related factors such as urokinase plasminogen activator (uPA), tissue plasminogen activator (tPA), matrix metallopeptidases 2 (MMP-2) and MMP-9. Collectively, these results suggest that Taiwanin E treatments simultaneously impaired cell migration by inhibiting the expression of uPA, tPA, MMP-2 and MMP-9 through COX-2/EGFR/MAPK signaling pathway in human LoVo colon cancer cells.

Keywords: Lovo cell lines; Taiwanin E; cyclooxygenase-2; MMP-2; MMP-9