

ANTITUMOUR EFFECT OF SYNTHETIC STILBENES AGAINST BREAST, LUNG AND COLON CANCER CELL LINES

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ABSTRACT

Chemotherapy is known to be one of the alternative treatments for cancer; however, its use is limited due to the side effects. Therefore, new chemotherapeutic drugs with low toxicity are required and should be developed. This present study aims to (1) propose the production of twelve unnatural stilbene derivatives (S1 – S12) via organic synthesis methodology and (2) evaluate these synthetic compounds in the cytotoxicity tests against breast, colon and lung cancer cell lines. The syntheses of S1 – S12 were performed through palladium-catalysed reaction, the Heck coupling. Initially, benzaldehyde was converted into styrene through Wittig reaction. Then, acetylation, benzylation or benzylation were performed to protect the hydroxyl group of the *para*-iodophenol. Finally, the protected *para*-iodophenols and the styrenes were coupled to produce the stilbenes. The molecular structures were established using nuclear magnetic resonance spectroscopy after chromatographic purification. For the cytotoxic test, the stilbenes were dissolved in DMSO (0.01-100 μ M) and tested against the cancer cell lines (MDA468, MDA231, T47D, HCT116, HT29 and A549). After 72 hours of incubation, the MTT assay was performed and the data obtained from the ELISA micro plate reader was used to plot the dose-response curve of which IC₅₀ (concentration that inhibit 50% of the cells) was determined. From the synthesis effort, the stilbenes were produced in good yields. The most active stilbenes that treat all cancer cells were S1 and S9. For colon cancer cell lines, S1 only responded positively in HT29, meanwhile S9 was coactive in both HCT116 and HT29. Other stilbenes (S6, S8 and S11) were active in HCT116. It was also found that S2 was potent only in HT29. In conclusion, the stilbenes were found to be active in treating selected cancer cell lines (MDA468, HCT116, HT29 and A549).

Keywords: Synthesis, antitumour, stilbene