

2nd International Conference on **ANALYTICAL CHEMISTRY AND CHROMATOGRAPHY METHODS**

November 20-21, 2019 | Berlin, Germany

Lee Ting Hun et al., J Chem Tech App 2019, Volume 3

ANTI-CANCER ACTIVITY AND IMMUNOADJUVANT PROPERTIES OF EDIBLE BIRD'S NEST EXTRACTS ON HUMAN BREAST CANCER CELL LINE

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Edible Bird's Nest (EBN) is well regarded as an immune enhancing nutraceutical food especially among the Chinese. Current cancer therapies bring adverse side effects, thus identification of a safe adjuvant medicine like EBN can provide a quality life for patients. The aim of this study is to evaluate the anti-cancer activity and immunoadjuvant properties of EBN extract on human breast cancer cell line (MCF-7). Primarily, three types of EBN extracts coded as HMG, EHMG and pHMG were prepared using the water extraction method. These EBN extracts were then tested on their cytotoxicity level against MCF-7 and human immune cells (CD8+ and CD14+). Production of the key pro-apoptotic and anti-apoptotic molecules released in MCF-7, CD8+ and CD14+ cells before and after EBN treatment were measured through mRNA expression level, ELISA and Multiplex assay. Among the three EBN extracts, HMG showed the highest cytotoxic effect towards MCF-7 cells with IC₅₀ of 15µg/mL. However, HMG showed no harm towards CD8+ and CD14+ cells with cell viability of more than 90%. qRT-PCR results for activated CD8+ and CD14+ cells showed increased of pro-apoptotic gene expression after treated with HMG in co-culture. At the same time, supplementation of HMG increased the apoptosis through down regulation of anti-apoptotic genes and the up-regulation of pro-apoptotic genes in MCF-7 cells. Enhancement of pro-apoptotic and down regulation of anti-apoptotic soluble factors by non-activated and activated CD8+ and CD14+ cells in single and co-culture after treated with HMG also showed in ELISA and multiplex assay. In conclusion, the present study showed that HMG extract is a potential anti-cancer agent and causes no harm to human immune cells. qRT-PCR, ELISA and multiplex tests also verified that HMG acts as an immunoadjuvant by enhancing pro-apoptotic function in the human immune cells.

BIOGRAPHY

Lee Ting Hun is a senior lecturer and the Head of Edible Bird's Nest Unit in School of Chemical Engineering, Universiti Teknologi Malaysia. He is the pioneer in carrying out bird's nest and swiftlet ranching research in Malaysia. He has led 20 over numerous government and private sector projects amounting to more than RM2 million. He has also published 30 over-indexed journals papers, conferences and seminars papers, book and book chapter. For decades, he has invented numerous processes and innovate some noble products related to bird's nest, nutraceutical and cosmeceutical. His contribution to the industry has won him the Malaysian Scientist Award and the Geneva Invention and Innovation Award. He has also co-authored the Malaysian SIRIM standards for Edible Bird's Nest and Swiftlet Ranching Standards. Recently, he has also been appointed as Malaysia Bird's Nest Expert.

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