Palm Tocotrienol Adjuvanted Dendritic Cells in Cancer Vaccines

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Abstract

Dendritic cell (DC) vaccine is a potent form of cancer immunotherapy due to the ability of DCs to process and present antigens to T-cells and stimulates specific immune responses. However, development of cancer vaccine has often been hampered by poor immunogenicity of the relevant antigenic components, which require potent adjuvant in order to efficiently promote a protective immune response.

In this study, we have used Tocotrienol-rich fraction (TRF), a non-toxic natural compound as an adjuvant to induce an immune response and enhance the effectiveness of DC-based cancer vaccine to prevent tumor growth and spread in a mouse model of breast cancer.

Our findings show that TRF in combination with DC pulsed with tumor lysate injected subcutaneously, significantly inhibited the growth of 4T1 mammary tumour as compared to control group and mice injected with DC alone. Analysis of mice splenocytes and mixed lymphocyte reaction (MLR) assay revealed significantly higher levels of IFN-γ in the T-cells of mice treated with TRF and DC compared to control and mice injected with DC alone. Furthermore, CTL assay showed that subcutaneous injection of DC pulsed with tumor lysate in the presence of TRF induced tumor specific cytotoxic T-lymphocytes.

This study demonstrates the potential of TRF as an adjuvant in enhancing the effectiveness of DC based vaccines in treating breast cancer in a mouse model.