Summary of the Ph.D thesis No., **25421** Faculty of Veterinary Medicine, Urmia University.
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Author: Sara Tahvili
Title: Immunotherapy of breast cancer using tumor antigen pulsed bone marrow derived dendritic cells and its derived exosomes in mouse model.

Summary:

Immunotherapy is an important method in cancer treatment that helps strengthen the immune system, but it faces challenges such as weak immunogenicity of vaccines and immune suppression in the tumor area. The use of combined immunotherapy can help treat cancers, including breast cancer, by counteracting immunosuppressive agents and activating different stages of the immune-cancer cycle. This study investigates the effect of simultaneous administration of dendritic cells and exosomes derived from dendritic cells on immunological, cellular and molecular parameters in Balb/c mice with breast cancer. Mouse breast cancer cell line T1 4 was used for tumor induction in this research. In this study, mice were divided into six groups, including a healthy control group, a tumor control group without treatment, a group treated with doxorubicin at a dose of 2 mg/kg, a group treated with 106 dendritic cells, a group treated with exosomes derived from Dendritic cells were divided into 20 ug/ml and treated group with both cases. The treatment program consisted of two injections two weeks apart from the 14th day after tumor induction, and the evaluation of the effectiveness of the vaccine was done on the 35th day. The measurement indices included the proliferation of lymphocytes, hypersensitivity response, cytokine production and the expression of cancer-related genes such as MMP2. Caspase-3 and p53, the specific response of CTL cells, was the expression of CD107. Both vaccines, which included dendritic cells and exosomes derived from dendritic cells, caused a significant decrease in tumor growth, increased survival time, increased proliferation activity of splenic lymphocytes (indicating anti-tumor cellular immune response), increased hypersensitivity response. delayed (response of anti-tumor Th1 cells), shift of cytokine response towards Th1 cells, decrease of 4-IL production, increase of IFN γ cytokine production, decrease of MMP2 gene expression and increase of P53 and Caspase-3 gene expression In mice with breast tumors, the results showed that combined vaccines based on dendritic cells and exosomes derived from dendritic cells reduced tumor growth, increased survival and strengthened anti-tumor immune responses in mice. This study shows that the combination of these two types of immunotherapy can be effective in the treatment of breast cancer.

Key words: breast cancer, dendritic cell, exosomes derived from dendritic cells, immunotherapy, BALB/c mice.