Glucomannan as an adjuvant for breast cancer vaccine: An experience in mouse model

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Abstract

Breast cancer is one of the major causes of death in women. Chemotherapy of breast cancer shows side effects. May be improvement of immunotherapy using natural compounds to be useful in the therapy. Glucomannan is a water-soluble polysaccharide that is considered a dietary fiber. It is a hemicellulose component in the cell walls of some plant species. Glucomannan was found to induce anti-tumor effect on cancers like colon cancer. In this study, we assessed the adjuvant activity of Glucomannan combined with a breast tumor vaccine (lysate vaccine) on breast tumor-bearing mice. Breast tumor was implanted into the flank of inbred BALB/C female mice. Tumor-bearing mice were gavaged with Glucomannan and/or immunized with tumor antigen lysate vaccine or vaccine mixture with Glucomannan (Vaccine, Glucomannan/Vaccine combination). Immunization performed subcutaneously, three times with 100 µg vaccine with one week intervals. In addition, cyclophosphamide treatment and PBS as positive and negative control groups considered, respectively). Tumor mass changes monitored twice weekly and after immunization courses, mice blood was collected and IL-2, IL-4, IL-17, IFN-γ and TNF-α cytokine levels in sera were measured by commercial ELISA kits. Considering cytokines patters and tumor mass changes it seems that Glucomannan as adjuvant shifted immune responses toward Th1 pattern and suppresses tumor growth in the treated mice.

Recent Publications

1- Suppression of the Viability and Proliferation of HepG2 Hepatocellular Carcinoma Cell Line by Konjac Glucomannan. Sawai S, Mohktar MS, Safwani WKZW, Ramasamy TS. Anticancer Agents Med Chem. 2018;18(9):1258-1266.
2- Targeted depletion of tumour-associated macrophages by an alendronate-glucomannan conjugate for cancer immunotherapy. Zhan X, Jia L, Niu Y, Qi H, Chen X, Zhang Q, Zhang J, Wang Y, Dong L, Wang C. Biomaterials. 2014 Dec;35(38):10046-57.
3- Effects of konjac glucomannan on putative risk factors for colon carcinogenesis in rats fed a high-fat diet. Wu WT, Chen HL. J Agric Food Chem. 2011 Feb 9;59(3):989-94.
4- Comparative effects of cellulose and soluble fibers (pectin, konjac glucomannan, inulin) on fecal water toxicity toward Caco-2 cells, fecal bacteria enzymes, bile acid, and short-chain fatty acids. Chen HL, Lin YM, Wang YC. J Agric Food Chem. 2010 Sep 22;58(18):10277-81
5- Immunomodulatory Activity of Octenyl Succinic Anhydride Modified Porang (Amorphophallus oncophyllus) Glucomannan on Mouse Macrophage-Like J774.1 Cells and Mouse Primary Peritoneal Macrophages. Gurusmatika S, Nishi K, Harmayani E, Pranoto Y, Sugahara T. Molecules. 2017 Jul 15;22(7)

Biography

Nioosha Ahmadi is graduated from Islamic Azad University of Tehran Medical Science with a Bachelor's degree in Microbiology. She cooperates with Dr. Mehdi Mahdavi and his research team and works on adjuvant and vaccine development. Recently she joined with Dr. Mehdi Mahdavi and started a project which works on breast cancer vaccine in Balb/c mice model.

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