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Biogenic selenium nanoparticles can shift the immune response of breast cancer bearing mice toward Th1 pattern

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Tumor immunotherapy harness and enhance the innate powers of the immune system to fight cancer. In the present work, the immunomodulatory effect of biogenic selenium nanoparticles (SeNPs) on the breast cancer bearing mice which received 4T1 cells crude antigens (as vaccine) has been investigated. Sixty female inbred BALB/c mice were subjected to breast cancer by injection of 4T1 cells. After 10 days, all tumor bearing mice were divided into 4 groups as follows: Group 1 orally received phosphate buffer saline (PBS) every day and injected by PBS after tumor induction (control mice). Group 2 received 100 μg/day SeNPs as oral supplement for 30 days. Group 3 was injected by 4T1 cells crude antigens and no oral supplementation. In group 4, animals were supplemented by 100 μg/day SeNPs for 30 days and injected by 4T1 cells crude antigens. All injections were carried out on day 7, 14 and 28 after tumor induction. Oral supplementation was done since first day of tumor induction to 30 days after. At the end of study, the levels of cellular immunomodulatory components including granzym B, IL-12, IFN-γ, and IL-2 have been significantly increased ($P<0.05$) in mice which received oral SeNPs and 4T1 cells crude antigens as vaccine. In contrast the levels of TGF-β in these mice were decreased in comparison to other groups. Taken together, administration of SeNPs can enhance the immune response of cancer bearing mice which are subjected to tumor antigen to boost the immune response and also can shift this response toward Th1 pattern.

Biography

Mohammad Hossein Yazdi got his PhD in the field of Pharmaceutical Biotechnology from Tehran University of Medical Sciences, School of Pharmacy in 2014. His PhD work was about cancer treatment in particular by immunotherapy. Currently, he is an Assistant Professor at Biotechnology Research Center of Tehran University of Medical Sciences. He has published more than 20 papers in reputed journals and has been serving as a Senior Lecturer of Advanced Immunology and Cancer at Tehran University of Medical Sciences.

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