

NANO TECHNOLOGY AND NANO ENGINEERING & ALLERGY, IMMUNOLOGY AND INFECTIOUS DISEASES

World Congress on

July 24-25, 2019 | Vancouver, Canada

The perspective putative test-system for the indication of immune response upon the breast cancer progression based on the *Helix pomatia* agglutinin

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The risk of the development of breast cancer is a significant issue in modern medicine practice, especially in diagnostics and determination of the treatment strategy. More than 1.3 million patients suffer from cancer diseases, for instance, more than 508,000 women in the world have lost their lives due to breast cancer in 2011. The majority of issues regarding breast cancer treatment would be resolved using new immunological methods of diagnostics and immunotherapy. This study combined immunology and glycobiology to reveal new data that could be used for the construction of the novel test-system for the indication of the immune response upon the breast cancer progression. The purpose of this study was isolation, purification and characterization of lectins from albumen gland and mucus of *H. pomatia*, investigation their potential for the creation of an anticancer vaccine or a test system for monitoring or prognostication of the efficacy of the anticancer chemo and/or immunotherapy. For the isolation of the lectins from albumen gland homogenate and mucus we used salting out. ELISA was used for the detection of cross-reactivity of antibodies from serum of rats with transplanted Walker carcinosarcoma and also we used serum of patients with breast cancer of I-IV stages for the detection of antitumor antibodies with cross-reactivity with lectin. Western-blot with serum antibodies, which showed high cross-reactivity, was used for the identification of the protein fraction which had demonstrated high cross-reactivity by ELISA results. The cross-reactive protein fraction was purified by chromatography and characterized by using MALDI-TOF. Lectins represent a huge group of proteins and glycoproteins which

are able to selectively bind to glycans and glycan's determinants on biopolymers. Almost all groups of organisms contain lectins in different organs and tissues that represent a high potential for cancer diagnostics and for proper anticancer therapy construction. Malignization is known to promote the high level of cancer cells' proteins glycosilation. This increases the amount of untypical glycans on the surface of tumor cells which facilitates intercellular interaction, migration and adhesion. Different types of lectins are used as markers for screening different tumor processes for development of new therapies for oncological pathologies treatment and for the construction of anticancer vaccines. For example, agglutinin (lectin) of *Helix pomatia* is used for the prediction of breast cancer metastasis. It was shown experimentally that high index of binding of lectins to the tumor cell glycocalix is associated with a high risk of metastasis and the unfavourable prognosis. We isolated and characterized protein from albumen gland and mucus of *Helix pomatia* which showed cross-reactivity with serum antibodies of experimental animals with transplanted Walker carcinosarcoma and also observed cross-reactivity of antibodies of patients with breast cancer of I-IV stages. The titer of antibodies from serum of experimental animals and patients, which showed cross-reactivity with isolated proteins, correlated with tumor stages and the reaction for antitumor therapy. Proteins of *H. pomatia* could be used for the development of perspective test system for monitoring or prognostication of the efficacy of anticancer chemo and/or immunotherapy.

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