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Influence of the structure of viral antigens on the activity of adaptive immunity

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Most modern vaccines are minimal compositions which possess low immunogenicity, while large aggregated antigen particles are required to activate a long-term immune response. Therefore, the study of molecular basis of the interaction of antigens with immunocompetent cells and the mechanisms of the immune response remains an important problem of vaccinal prevention. In this case, there is a demand to develop of new delivery systems and antigen presentation that can enhance immunogenicity and effectiveness of vaccine preparations without use of additional components. The purpose of this research was to identify the correlation between the form of supramolecular organization of viral antigens and the induction of inflammatory reactions in the organism. Mice weighing 20-25 grams were immunized once intraperitoneally with purified glycoprotein antigens (HA+NA) obtained from the influenza virus, strain A/Aichi/2/68 (H3N2), having the following forms of supramolecular organization: Micelles; immunostimulating nanocomplexes (virus-like nanostructures 60 - 80 nm in diameter formed by antigens, lipids and plant saponins (Quil-A and SO)); nanostructured chitosan with adsorbed antigens. For comparison, animals were also immunized with purified viral particles. Day later, peritoneal exudate cells were collected for isolation of nucleic acids. Expression level of genes responsible for the synthesis of IgA, IgG2a antibodies was determined. A highest gene expression activity was detected after mice immunization with immunostimulating complexes based on viral antigens, saponins (Quil A; SO) and lipids. Sufficiently high expression level of studied immunoglobulins, but less than immunostimulating complexes, was recorded by immunization of mice with intact virus particles and chitosan nanostructures. Viral glycoprotein antigens in the form of classical micelles showed the lowest activity in stimulation of studied genes. Thus, it was shown that the expression level of genes responsible for the induction of IgA and IgG2a antibodies at immunization of experimental animals with different structural forms of viral antigens was largely depend on molecular structure of viral antigen.

Biography

Pavel G Alexyuk has her expertise in evaluation and passion in improving the health and wellbeing. Her open and contextual evaluation model based on responsive constructivists creates new pathways for improving healthcare. She has built this model after years of experience in research, evaluation, teaching and administration both in hospital and education institutions. The foundation is based on fourth generation evaluation (Guba & Lincoln, 1989) which is a methodology that utilizes the previous generations of evaluation: measurement, description and judgment. It allows for value-pluralism. This approach is responsive to all stakeholders and has a different way of focusing.

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