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Modifications improving effectiveness of DNA vaccine against H5N1

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Injection of plasmid or linear form of DNA encoding vaccine antigen can lead to the induction of immune response. This approach offers a number of potential advantages over traditional approaches, including the stimulation of both humoral and cell-mediated responses, the relative ease of large-scale manufacture and improves vaccine stability enabling withdrawal from restrictive and very expensive cold chain transport. The most important disadvantage is low level of antigen expression *in-vivo* and hence low immunogenicity of vaccine. Several strategies can be used to overcome this difficulty. Our studies are focused on DNA vaccine against H5N1. To improve vaccine immunogenicity and reduce its cost of production we evaluated different strategies of modification of basic vaccine variant prepared. Basal H5 HA DNA vaccine was modified in the following ways: i - proteolytic cleavage site was removed, ii – codon usage was change using three different algorithm, iii – expression cassette was modified to permit DNA transport to nucleus increasing gene expression level, iv – RNA-OUT vector was used allowing selection without antibiotics and enabling *in vivo* expressed proteins transport to different cell compartments: Endosome or secrete outside the cell. All vaccine variants were tested in mice and vaccine efficacy was measured by ELISA assay. Our results showed that tested doses of DNA vaccine elicit HA- dependent humoral response. The level of immunological response depended on the tested vaccine variant and the best modification was chosen for further studies.

Biography

Róża Sawicka graduated as biologist, specialization in biochemistry in 2009 at Maria Curie-Skłodowska University in Lublin. She completed the Post-graduate studies in 2012 as Research Project Management and Commercialization of Research Results at University of Technology in Łódź. Since 2009 she was associated with Institute of Biochemistry and Biophysics Polish Academy of Sciences (Warsaw, Poland), where she worked as biologist in project concerning veterinary DNA vaccine against influenza and now she is working in this interesting area as a PhD student.

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