Alexandre Samoylov et al., J Pharm Drug Deliv Res 2016, 5:3(Suppl)
http://dx.doi.org/10.4172/2325-9604.C1.009

Intradermal delivery of DNA vaccines targeting GnRHR

Alexandre Samoylov, India Napier, Anna Cochran, Bettina Schemera, Nancy Morrison, Russel Cattley and **Tatiana Samoylova**
Auburn University College of Veterinary Medicine, USA

DNA vaccination is achieved by injecting an animal with genetically engineered DNA to stimulate antigen-specific immunological responses. One of the greatest advantages of DNA vaccines is that they are able to activate both arms of the immune system, humoral and cell-mediated. Potency of DNA vaccines can be increased drastically (hundreds of times) via advanced delivery methods. Even though muscle was the first and is the most traditional site for DNA injections, skin was shown to be an immunologically superior site for DNA immunization due to abundant presence of immune cells such as Langerhans and dendritic cells. This study reports the development of DNA-based contraceptive vaccines constructed to stimulate effective immune responses against pituitary cells expressing gonadotropin releasing hormone receptors (GnRHR). Two delivery routes for the constructed vaccines were tested in mice: Intramuscular injection into quadriceps muscle, and Intradermal injection of the ear pinna. Inoculation of the ear pinna, but not intramuscular injection, was shown to stimulate immune responses leading to suppression of testosterone (indirect indicator of the vaccine efficacy) and decreased expression of GnRHR mRNA that might be due to partial ablation of pituitary gonadotropes expressing GnRH receptors. The success of the intradermal delivery might be explained by the special structure of the pinna, which consists of two layers of epidermis and dermis (separated by ear cartilage) containing a high number of dendritic cells (most effective APCs) within a restricted area connected with major superficial cervical draining lymph nodes.

Biography

Alexandre Samoylov has received his PhD in Molecular Biology from the Institute of Molecular Biology (Kiev, Ukraine). He has completed his Post-doctoral studies at the DLO-Center for Plant Breeding and Reproduction Research, Netherlands and at the Institute of Plant Genetics & Crop Plant Research, Germany. Presently, he holds a Research Fellow IV position at the Scott-Ritchey Research Center Auburn University College of Veterinary Medicine, USA. He has published more than 40 papers in peer-reviewed journals. His current focus is on development of phage and DNA-based vaccines for animals.

samoyam@auburn.edu

Notes: