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Eight segment swine influenza virus containing H1 and H3 hemagglutinins as a candidate for novel vaccine in pigs

Aleksandar Masic
Bioniche Life Sciencies Inc, Canada

Abstract

Infections with swine influenza virus (SIV) cause significant economic loss in the pork industry and presents continuous public health concern. Currently used vaccines against SIV are killed and their protection efficiency in the field is limited. Considering a pandemic potential of a novel influenza viruses emerging through the process of genetic reassortment in pigs, the importance of a vaccination is highlighted as the most effective countermeasure. Live attenuated influenza vaccines (LAIV) provide strong, long-lived, cell mediated and humoral immunity against different influenza subtypes without the need for perfect antigen matching. Here we report a generation of potential LAIV, an eight segment SIV harbouring two different SIV hemagglutinins (H1 and H3). The chimeric H1H3 HA segment is constructed by fusing the H3 HA ectodomain with the non-coding region, cytoplasmic tail, transmembrane domain and stalk region of NA segment from H1N1 SIV. This H1H3 mutant SIV showed similar kinetics and growth properties to parental wild type virus *in vitro* when exogenous neuraminidase is provided. However the H1H3 mutant SIV was highly attenuated in pigs, demonstrating the great potential to serve as LAIV with broad protection.

Biography

Aleksandar Masic graduated from the Faculty of Veterinary Medicine at University of Belgrade, Serbia and completed his PhD program at the Vaccine and Infectious Disease Organization (VIDO) at University of Saskatchewan, Canada. Aleksandar did his postdoctoral training at the National Center for Foreign Animal Disease-Canadian Food Inspection Agency (NCFAD-CFIA) in Winnipeg, Canada working on the development of influenza vaccines for domestic animals. Currently Dr. Masic holds the position of Director for Clinical Research and Development at Bioniche Life Sciences Inc. and is responsible for all the clinical work as well as for development and evaluation of new technologies that can be used in vaccine development. Dr. Masic is also adjunct faculty member with the pathobiology department at Ontario Veterinary College at University of Guelph, Canada. He is an author of several manuscripts published in peer-per viewed journals.