INTERNATIONAL JOURNAL OF HEALTH & ANIMAL SCIENCE & FOOD SAFETY

Keywords

Edible vaccines, Nicotiana tabacum, VTEC strain, Avidity of antibody, *Streptococcus pneumoniae, Monoclonal Antibody*

CORRESPONDING AUTHOR

Angela Lombardi
angela.lombardi@unimi.it

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UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI SCIENZE VETERINARIE PER LA SALUTE, LA PRODUZIONE ANIMALE E LA SICUREZZA ALIMENTARE

Avidities of human monoclonal antibodies derived from an adult immunized with pneumococcal polysaccharide vaccine.

A.Lombardi[a*], S. Bandi[b], J. T. Rahkola[b], L. Rossi[a], E. N. Janoff[b], A.Baldi[a]

[a]*Faculty of Veterinary Medicine, Department of Health, Animal Science and Food Safety Via Celoria 10 20133 Università degli Studi di Milano, Milan.*

[b]*School of Medicine Division of Infectious Disease 12700 East 19th Avenue, Box B168 Aurora, CO 80045 University of Colorado Anschutz Medical Campus, Aurora Denver, USA.*

Abstract

Plant based vaccines provide an instructive opportunity for immunologists. We have developed a plant-based oral vaccine against verocytotoxin–producing *E. coli* (VTEC) in piglets (Rossi et. al 2014). We engineered two independent lines of *Nicotiana tabacum* plants for the seed-specific expression of VTEC antigens, represented by the major subunit FedA of the F18 adhesive fimbriae and the B-subunit of VT2e toxin respectively (Rossi et. al. 2013). Edible vaccines in particular are of interest as they are able to stimulate the mucosal immune system to produce secretory IgA (S-IgA) at mucosal surfaces and, potentially IgG in the blood. The quality of the antibodies, such as avidity, should be considered in evaluating the efficacy of these vaccines. To develop this area, we determined avidity (strength of antibody-antigen binding) of IgG to the capsule of another mucosal pathogen, *Streptococcus pneumoniae*. Using pneumococcal capsule-specific IgG human monoclonal antibodies (hMAb) cloned from single cells of a subject immunized with pneumococcal vaccine, we defined serotypes specificity and the avidity of these antibodies with ammonium thiocyanate (0, 4M, 2M, 1M 0.5M 0.025M) dissociation. IgG with lower avidity to the capsule are dissociated at lower NH4SCN levels, whereas IgG with higher affinity require higher levels. We identified a range of avidities for 11 hMAB's (range X-Y MNH4SCN). We will evaluate the avidity of antibodies after immunization with edible vaccines against VTEC strain in piglets about which little in known, but as demonstrated in *Granoff et al*. the high-avidity antibodies are required in generating a more effective vaccine.

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ISSN: 2283-3927