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Towards a subunit oral vaccine to Newcastle disease in transgenic duckweeds

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Newcastle virus disease (ND) in poultry is highly contagious. Weak strains cause loss in egg production, virulent strains kill the birds¹. NDV virions possess an envelop and contain a single molecule of linear, negative sense RNA coding for at least six proteins. The important proteins for subunit vaccines are two glycoproteins: the hemagglutinin-neuraminidase (HN), and the fusion protein (F), which are used as antigens for immunization. Immunization is currently by injection, nasal spray, ocular or drinking water that contain the HN antigen.

Duckweeds are small, edible monocot plants that float on the surface of fresh water and need only light, air and some common minerals for rapid growth. Plants of these genera are preferred food as indicated by their name. Transgenic edible plants can deliver vaccines to different animals².

We introduced HN and the F protein genes into a duckweed species to deliver these antigens for induction of protective immune response in chickens. We get high expression of both antigens in the transgenic plants, which grow normally with no apparent phenotypic change.

Corresponding author email

lpron@weizmann.ac.il

Scientific Session

Applications

Keywords

NDV, duckweed, vaccine, chicken

References

1 Moller, L. et al. (2018) Preventive Veterinary Medicine, 152, 41-48. 2 Shaaltiel, Y. et al. (2007) Plant Biotechnol. J. 5, 579-590

Primary author(s) : Dr. VUNSH, Ron (Weizmann Institute for Sciences)

Co-author(s) : Dr. COHEN, Maja (Averma Therapeutics); Dr. KAUR, Manpreet (Weizmann Inst.); Dr. SAMACH, Aviva (Weizmann Inst.); Prof. LEVY, Avraham (Weizmann Inst.); Prof. EDELMAN, Marvin (Weizmann Inst.)

Presenter(s) : Dr. VUNSH, Ron (Weizmann Institute for Sciences)

