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Improving Immune Responses In Avian IAV H5 Immunization By Sustained Antigen Release Technology

Inhalt

Recent global outbreaks of highly pathogenic avian influenza A(H5N1) highlight the need for vaccines that can prevent human transmission. Seqirus's zoonotic influenza A(H5N8) vaccine (approved in 2024) protects against clade 2.3.4.4b H5N1 viruses but requires a booster, which may reduce compliance. Prolonged antigen exposure can strengthen humoral immunity; therefore, sustained antigen release using DelSiTech Silica Matrix™ Technology may improve vaccine performance.

This study compared humoral responses in mice after extended (silica-formulated), escalating (seven doses; 0.2%–63.3%), or bolus subunit immunization. C57BL/6 mice received subcutaneous recombinant H5 hemagglutinin (~3.75 μg) with/without Addavax adjuvant. Encapsulated H5 microparticles were embedded in silica hydrogel for sustained release. Serum H5-specific IgG, IgM, IgA, and H1/H3 cross-reactivity were measured at weeks 3 and 6 by ELISA.

Escalating dosing induced IgG but was lower than silica groups, which produced strong IgG at week 3 with only minor decline by week 6. Adjuvant was needed for strong IgG in all groups except silica. Weak IgM appeared only in escalating-dose groups; IgA was not detected. Limited H1/H3 cross-reactivity occurred only in the escalating dose + adjuvant group.

Overall, single-dose silica formulation generated superior IgG compared with bolus vaccination.

Keywords

Avian influenza, H5, hemagglutinin, sustained antigen release, silica technology

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Yes, I am a junior scientist.

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