5th International Conference on
Vaccines, Immunology and Clinical Trials
March 23-24, 2022 | Webinar
Volume: 12

A self-adjuvanting vaccine delivery platform with potential to eliminate the cold-chain hurdle

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The requirement for vaccines to be kept sufficiently cold during transport makes vaccine distribution to some populations (where the vaccines are greatly needed) extremely challenging, if not impossible. We have designed a versatile vaccine delivery platform based on Vibrio cholerae ghosts (VCG) that eliminates the need for the expensive cold chain. Moreover, this platform is self-adjuvanting and capable of simultaneously delivering multiple vaccine antigens to the immune system. It also offers an attractive approach for developing combination vaccines, especially against diseases with epidemiological overlap. Here, we present data showing a VCG-based vaccine expressing the Chlamydia trachomatis porin B and polymorphic membrane protein D proteins protects against infertility in mice following mucosal immunization. Vaccine efficacy was assessed by evaluating the intensity and duration of genital chlamydial shedding following intravaginal challenge with live chlamydiae. Protection against upper genital tract pathology was determined by assessing infertility and tubal inflammation. We demonstrated that the elicited immune effectors reduced the length and intensity of genital chlamydial shedding as well as the incidence of tubal inflammation. Moreover, immunized mice were protected against Chlamydia-induced infertility. These results highlight the potential of the VCG platform for eliciting immunity in the female genital tract and preventing the sequelae of chlamydial infection such as infertility and upper genital tract inflammation.

Biography

Francis O Eko is professor of Microbiology and Immunology at Morehouse School of Medicine, Atlanta (USA). His expertise is in design and development of self-adjuvanting, cold-chain free vaccines and vaccine adjuvants. Current research involves investigation of the mechanisms of Chlamydia infection- and vaccineinduced immunity and the effect of VCG-based adjuvants on immunity to mucosal and systemic vaccines.

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