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Delta Inulin (Advax™): A New Paradigm in Vaccine Adjuvants

Highly purified vaccines commonly suffer from poor immunogenicity. Current paradigms attempt to address this problem through use of potent innate immune activators as vaccine adjuvants, thereby mimicking natural infection. Unfortunately this leads to increased vaccine reactogenicity and impaired safety. Advax™ is a novel polysaccharide adjuvant based on delta inulin that provides robust enhancement of humoral and cellular immune responses despite an apparent absence of danger signals. This has been shown to translate into enhanced vaccine protection against both homologous but also heterologous strains, without compromising vaccine tolerability and safety. Advax successfully enhanced vaccine immunity and protection in models of seasonal and pandemic influenza, Japanese encephalitis, SARS, HIV, hepatitis B, anthrax, and Ebola. Consistent with broad based activity it enhanced vaccine protection in neonatal pups and pregnant dams and to date has been found to be active across all mammalian species. Whilst the exact mechanism of adjuvant action remains uncertain, Advax has been shown to mediate chemotaxis, dendritic cell maturation, and enhanced antigen processing and presentation. In addition to confirming its adjuvant activity extends to humans, recent influenza vaccine trials revealed Advax specifically increases the rate of B-cell-receptor(BCR) CDR3 mutations in day 7 post-immunization plasmablasts, consistent with enhanced BCR affinity maturation. Based on this data Advax represents a new paradigm in non-inflammatory adjuvants thereby providing an exception to the 'danger-signal model' of adjuvant action.

Biography

Nikolai Petrovsky MBBS, FRACP, PhD is an active hospital clinician, research professor at Flinders Medical Centre, Adelaide Australia and research director of Vaxine, an Australian vaccine development company. He is Secretary-General of the International Immunomics Society and has received major funding from the US National Institutes of Health to develop novel biodefense vaccines and adjuvants. He has won prestigious awards including the AMP Innovation Award at the 2009 Telstra Business Awards and an Ernst & Young Entrepreneur of the Year in 2010. He has taken four vaccines to the clinic and has authored over 100 scientific papers and book chapters.

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