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# IMPROVING THE DURATION OF IMMUNITY FOR FMD VACCINES

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**Chemically inactivated, oil adjuvanted foot and mouth disease (FMD) vaccines are a critical element in FMD control in developing countries. Although these vaccines are effective in pigs and ruminants, protective immunity is not reached quickly, is short-lived (~3 months) and is serotype and sometimes strain-specific. More appropriate vaccine strains that induce broader protection, together with identification of novel adjuvants that provide a greater duration of immunity and simplified methods to measure vaccine quality would make a significant contribution to FMD control and to livestock development in developing countries. Oil adjuvant vaccines induce variable T cell responses, whilst novel adjuvants can prime greater and more consistent T cell and humoral responses that may give longer duration of protection. In our CIDLID funded grant, we had selected eight new adjuvants as potent immune enhancers, including ligands for TLR receptors that enhanced Th1 priming in various human or animal vaccines. The aim was to supplement the oil component of the adjuvant with a novel immunostimulant that impacts on TLR or related signaling pathways. These eight new adjuvanted vaccines were tested in a pilot study in cattle at IIL, India. The four most efficacious ones (MPLA, Poly I: C, Abisco 300 and R848) were retested for Serotype A in a larger number of cattle at Pirbright, UK. The vaccinated cattle were challenged on 21 days post-vaccination. The most efficacious adjuvant, poly I: C, tested further in cattle for serotype O FMD vaccine for 7.5 months to assess its impact on the duration of immunity. The enhanced humoral and cellular responses were observed by incorporating poly I: C in FMD vaccine that increased the duration of immunity in comparison to the conventional oil adjuvant vaccine. Therefore, we conclude that there is a measurable T cell component to vaccine-induced protection in addition to humoral antibody component and strengthening this would improve efficacy and duration of immunity.**

## Biography

S Parida is trained as a Veterinarian and has completed his PhD in 1998 from TANUVAS, India and Postdoctoral studies from Institute for Animal Health, UK through Welcome Trust Travelling Research Fellowship. He is the Head of the Vaccine Differentiation group at the Pirbright Institute at UK since 2007 and additionally, he is a Jenner Investigator at the Oxford University and a Visiting Professor at Royal Veterinary College, UK. He has published more than 129 papers in reputed journals and has been serving as an Editorial Board Member of *PLOS One and Transboundary Emerging Diseases*.

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