

Antigen Delivery to the Draining Lymph Nodes is a Key to Intradermal Vaccination Efficacy



The present study published in the Journal of Dermatological Science examined components of the immune system and the skin lymphatic system, both of which are required for the immunogenic pathway of intradermal (ID) vaccines. Influenza A H1N1 haemagglutinin (HA) protein was used as the vaccine antigen in mouse models. Twenty-one days after administration with a single dose of the HA vaccine, the levels of serum anti-HA total IgG were significantly higher in the ID vaccine group when compared to the subcutaneous (SC) group.

Furthermore, by tracing antigen delivery using fluorescent dyes from the site of injection to the draining lymph nodes, the researchers established ID vaccination results in prompt and efficient delivery of the antigen into the draining lymph nodes when compared to SC vaccination. The draining lymph nodes were also found to play a significant role in the immunogenic pathway of the ID administered vaccine; surgical removal of the lymph nodes resulted in a significant decrease in the levels of serum anti-HA total IgG.

The findings also demonstrate that liquid vaccine formulations are delivered directly into lymphatic vessels and lymph nodes when compared to solid or topical vaccine formulations. The

latter are mainly trapped by skin-resident immune cells and then migrate to the lymph nodes. This could potentially have an effect on the nature of the immunogenicity to the antigen. Overall although ID vaccination was found to be effective when compared to SC vaccination, the former is largely dependent on efficient antigen delivery to the draining lymph nodes and subsequent uptake of the antigen by the immune cells pre-existing in the draining LNs.

[Tozuka, M. et al, 2016. Efficient antigen delivery to the draining lymph nodes is a key component in the immunogenic pathway of the intradermal vaccine. *Journal of Dermatological Science*.](#)