

P008 Microneedle facilitated delivery of pDNA to the epidermis
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The skin is a suitable target for therapeutic nucleic acid delivery; and in particular for genetic vaccination where antigen-encoding plasmid DNA (pDNA) targets resident epidermal Langerhans cells, which are capable of generating proficient immune responses. Unfortunately, the outermost layer of the skin, the stratum corneum (SC) represents a considerable barrier to the passage of macromolecules like pDNA. To address this, arrays of microfabricated microneedles are used to create channels through the SC permitting the passage of pDNA.

Delivery of functional pDNA, facilitated by microneedles is demonstrated in an optimized organ culture system utilizing viable *ex vivo* human skin. The plasmid pCMVHB-S2.S encoding the small and middle forms of the Hepatitis B surface antigen (HBsAg) is applied to the skin surface followed by microneedles. The skin is then cultured for 24 hours and subsequently processed for immunohistochemistry (IHC). The results showed positive gene expression from the vector localized to the vicinity of microneedle conduit.

The described approach offers a potentially more practical, proficient and cost-effective means of achieving vaccination than currently available.