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Needle-free injection of DNA vaccines: a brief overview and methodology.

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Abstract

The development of needle-free injection originally stemmed from a general apprehension of needle injections, disease transmission by accidental needle-sticks, and the need for effective mass immunization. Naked DNA vaccines, as attractive and universal as they appear, have not produced robust immune responses in test systems. However, proof of principle for DNA vaccines has been validated with a number of vaccine candidates in a variety of test systems, and the concept of DNA vaccines as a generic platform for vaccines still remains viable and attractive. Many avenues are being explored to enhance the immunogenicity of DNA vaccines. The easiest and most straightforward approach that can be quickly transitioned to a clinical trial setting is vaccine delivery by a needle-free jet injector. This approach has shown much potential in a number of cases and should become the lead method for enhancing DNA vaccines. This approach requires no additional development, and with an expanding market and willingness from jet injector manufacturers to produce prefilled syringes, the technique should become feasible for larger phase II/phase III trials.

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