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Universiteit Leiden



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Title: Replacing the needle and syringe for vaccine administration

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Replacing the Needle and Syringe for Vaccine Administration

1. For tetanus and hepatitis B vaccination, the Bioneedle is a good alternative delivery method for regular needle injections.

This thesis, chapter 4 & 5

2. Bioneedles offer a solution to a number of problems (delivery speed, fear for needles, vaccine stability, cold chain) related with vaccination practices.

This thesis, chapter 4

3. The Bioneedle is a safe vaccine delivery system.

This thesis, chapter 6

4. For dermal vaccine studies with fluid jet injectors, the pig is a better animal model than mice.

This thesis, chapter 7

5. There is still a lack of certainty whether intradermal delivery offers significant immunological advantages compared with intramuscular or subcutaneous delivery.

J.K Hickling Bulletin of WHO (89) 2011

6. The viable epidermis offers a significant permeability barrier to both small molecules and macromolecules and becomes the rate-limiting step upon sufficient permeabilization of the stratum corneum.

N.S. Andrews et al. Pharm Res (30) 2013

7. To make optimal use of animals and rapidly bring safe and effective vaccines to the market, we must choose the most appropriate model and not restrict investigations to the least expensive and most convenient animal models.

V. Gerdts, Future Microbiol (2) 2007

8. While there has been considerable development of intradermal vaccination devices in the past years, there is still a need for further improvement to the design of devices for intradermal administration in order to fulfil their potential to be competitive with conventional needle and syringe forms of administration.

E. E. Kis, Vaccine (30) 2012

9. Science appears calm and triumphant when it is completed: but science in the process of being done is only contradiction and torment, hope and disappointment.

collaborator of Louis Pasteur

10. In tegenstelling tot ontwikkelingslanden zijn voor westerse landen naadloze toedieningsvormen een luxe product.
11. De farmaceutische industrie, die producten vervaardigt welke van vitaal belang zijn voor de volksgezondheid, hebben een maatschappelijke verantwoordelijkheid die niet ondergeschikt mag worden gemaakt aan het winstbejag.
12. Iedere promovendus zou tijdens de promotietijd een review moeten schrijven.