



Leiden University Research & Innovation Services

New Microneedle Applicator Device

Market Sector(s): Transdermal drug delivery - Medical devices

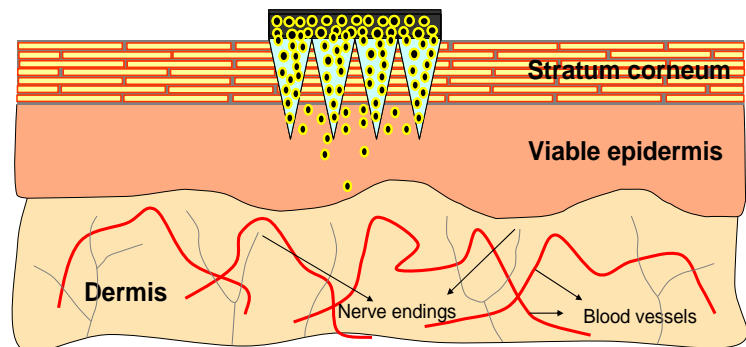
Type of Opportunity: Product and/or Licensing opportunity

Stage of Development: Prototype available for demonstration

Description:

Scientists at Leiden University have developed and produced an electronic device to apply microneedle arrays to the skin. Microneedles are designed to be painless whilst overcoming the natural barrier function of the skin that is located in the outermost layer of the epidermis, the stratum corneum (SC). Ideally, the microneedles penetrate the SC and reach the viable epidermis in order to deliver the injected substance, which will then reach the blood vessels that reside in the dermis through further diffusion. Since no nerve endings reside in the epidermis, this method should result in painless drug delivery (see figure). Recently it was shown that using manual application, piercing the skin was unsuccessful with microneedles equal to or shorter than 300 μm , which was postulated to be caused by the elasticity of the skin that enabled folding of skin around the needles. As bigger needles (550 μm in our studies) result in an increase of pain sensation and can cause bleedings, a solution was sought in the application of the needles.

Therefore, an electronic device was developed that allows the insertion of microneedles into the skin with a fixed predetermined (high) velocity. This device was found to overcome the elasticity of the skin, using 300 μm needles, as its use resulted in more effective and higher consistent application/puncturing. Furthermore, the device also overcomes the interindividual and intraindividual variation of skin elasticity, which is caused by factors such as age and skin region, through the fixed predetermined velocity.



Key Benefits:

- Compatible with different microneedle arrays
- Efficient and reproducible delivery method

Applications:

- To apply microneedle arrays to the skin

Patent Status: For this invention a patent application has been filed.



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