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Development of hyaluronan-based dissolving microneedle arrays for dermal vaccination

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Stellingen

Behorende bij het proefschrift

Development of hyaluronan-based dissolving microneedle arrays for dermal vaccination

1. The molecular weight of hyaluronan and the increase in antigen loading significantly affect the dissolution time of dissolving microneedles.

Chapter 4 and 5

2. Vaccination by means of dissolving microneedles evokes an immune response comparable to the subcutaneous vaccination.

Chapter 4 and 6

3. The design of the mold is a critical parameter in the fabrication of dissolving microneedles by micromolding.

Chapter 4

4. The presence of a curved microneedle array-surface improves the penetration efficiency of microneedles both by impact and pressing force application.

Chapter 3

5. Vaccines are efficient tools to reduce disparities in wealth and inequities in health.

F. Andre et al, Bulletin of the World Health Organization (86) 2008

6. Dissolving microneedle patches are well tolerated and strongly accepted by human subjects, which will facilitate further clinical translation of this technology.

Arya et al, Biomaterials (128) 2017

7. Microneedles shorter than 400 μm do not cause pain. Microneedles are significantly less painful than hypodermic needles.

Kim et al, Adv. Drug Deliv. Rev., (64) 2012

8. Transient mechanical stress from microneedle insertion can induce a natural local innate immune response which can serve as a physical adjuvant to enhance antigen-specific adaptive immunity.

Depelsenaire et al, J. Invest. Dermatol., (134) 2014

9. The value and the utility of any experiments are determined by the fitness of the material to the purpose of which it is used.

Gregor Johann Mendel

10. In the middle of difficulty lies opportunity.

Albert Einstein

11. No man ever steps in the same river twice.

Eraclito

12. Chiano, mierulo, ca 'a via è petrosa.
(Carefully, blackbird, on the street you will find a lot of stones.)

My father, Daily life proverb