

마이크로니들을 이용한 효율적인 인플루엔자 백신접종법 개발(Microneedle Patches for Improved Influenza Vaccination)

김유천[†]

KAIST, Department of Chemical and Biomolecular Engineering
(dohnanyi@kaist.ac.kr[†])

Morbidity and mortality due to influenza could be reduced by development of effective vaccination methods. Immunization via the skin is attractive, because, in large part, the skin is replete with antigen-presenting cells such as Langerhans and dermal dendritic cells. Arrays of metal micron-scale needles were coated with influenza inactivated virus vaccines suitable for simple, manual application. A single dose of influenza vaccine from microneedles (MNs) generated strong antibody and cellular immune responses in mice and provided superior protection against lethal viral challenge at the main site of viral replication in the lung, as evidenced by virus clearance below the detection limit. Additionally, microneedle vaccination resulted in enhanced cellular recall responses after challenge. Apart from immunologic advantages, microneedles also offer potential logistic opportunities. The small size of microneedles should facilitates storage, stockpiling and transportation of influenza vaccines. Vaccination should be faster and simpler because microneedles are painless and suitable for self administration.