

## Catalytic hydrogel for treatment to atopic dermatitis

김예은, 최승우<sup>1</sup>, 김재윤<sup>†</sup>  
성균관대학교; <sup>1</sup>삼성융합의과학원  
(kimjaeyun@skku.edu<sup>†</sup>)

Atopic dermatitis (AD) is one of common inflammatory diseases of the skin. It is known that the oxidative stress was higher in the AD patients. One of the main components which can increase the oxidative stress is reactive oxygen species (ROS). Although the major treatment of AD is steroid, it can cause Cushing's syndrome which can accompany weight gain and mental disturbance as side effects. Here, we developed catalytic hydrogel to remove ROS from the AD lesion. The water-soluble autocatalytic ceria nanoparticles (CeNPs) capable of scavenging ROS were embedded within the hydrogel patch. The catalytic hydrogel showed to remove hydrogen peroxide ( $H_2O_2$ ) and hydroxyl radical ( $\cdot OH$ ) more significantly than hydrogel without CeNPs. As CeNP-hydrogel contains high amount of water, the hydrogel could also contribute to moisturize the dried skin of AD. There was no cytotoxicity when incubating CeNP-hydrogel with human dermal fibroblasts and the CeNP-hydrogel showed a cytoprotective effect in high  $H_2O_2$ -containing media. These characteristics of the proposed catalytic hydrogel patch may help alleviation of the symptoms of AD.