Skin application of tape and MN patches Twenty consecutive D-Squame tape strips (22 mm diameter) were collected from the lesional skin of the patients with AD. Hollow MNs, blank patches, and HA-MNs were also applied to the lesional skin of these patients for 10 min.Upon removal from the skin, HA-MNs were dissolved, and proteins in the skin metabolites were collected for experimental analysis (Figure 1B2,B3).2.4 Protein extraction To extract proteins from the skin metabolites of the tape, hollow MNs, blank patches, and HA-MNs, each sample was scraped into 1% sodium dodecyl sulfate (SDS) buffer34, 35 (Thermo Fisher Scientific).2.5 Total protein quantification To quantify the concentration of total proteins in the skin metabolite extracts, a bicinchoninic acid (BCA) protein assay kit (Thermo Fisher Scientific) was used according to the manufacturer's protocol.3 RESULTS 3.1 MN patch design Biocompatible HA-MNs (each 160 array, 1 mm base width, 650 um height) were fabricated using the droplet extension method32 by drying a pharmaceutical-grade HA solution on top of a hydrocolloid .patch (Figure 1A).Statistical significance was set at p0.05