Supplementary materials

Low-temperature multiple micro-dispensing on microneedles for accurate transcutaneous smallpox vaccination

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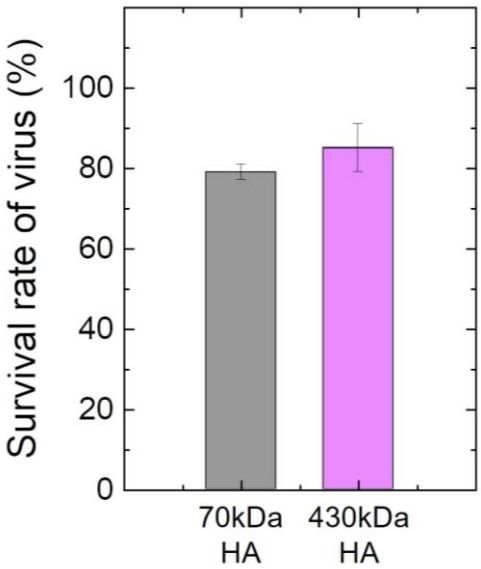

Figure S1. Effect of the MW of HA used as a viscous enhancer on the activity of smallpox vaccine (vaccinia virus) in coating solutions.

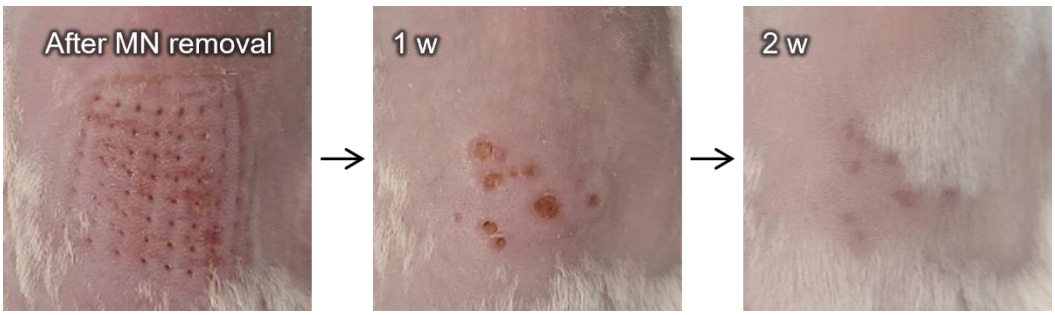

Figure S2. Photographs showing the cutaneous reaction at the inoculation site with vaccinia virus-coated MN patch.

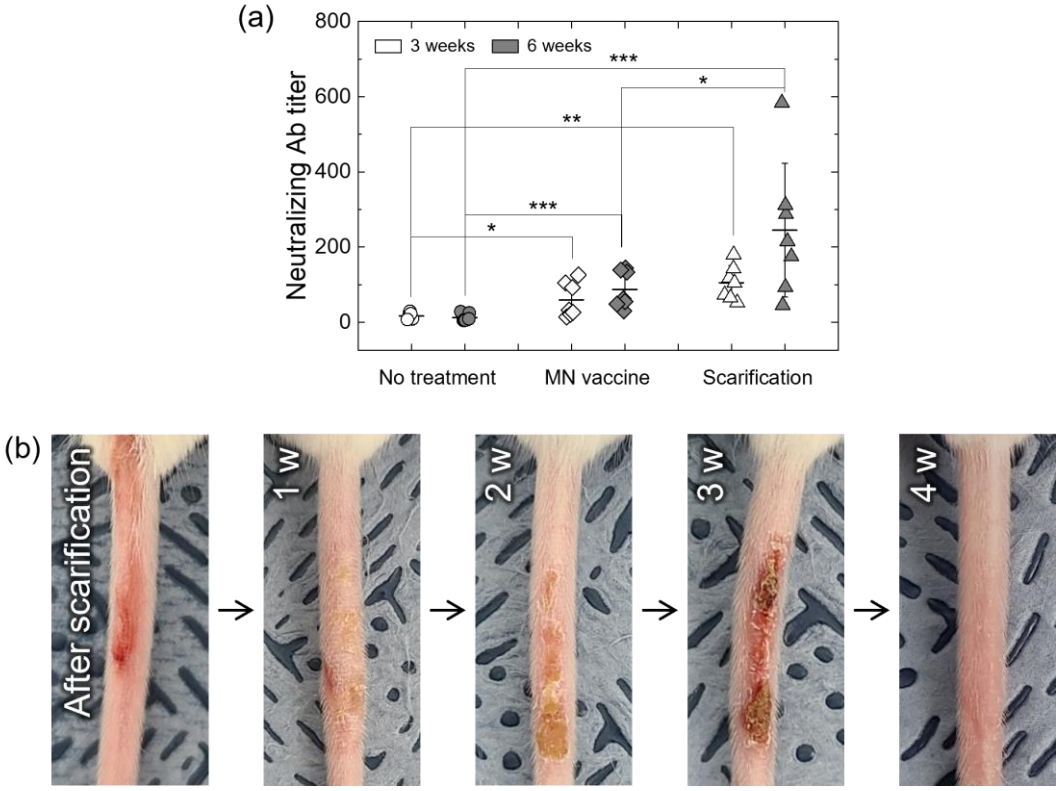

Figure S3. (a) Neutralizing antibody titers at 3 and 6 weeks after immunization with smallpox vaccine (2×10^5 PFU) using tail scarification technique. For immunization, female BALB/C mice were vaccinated by applying a droplet of 20 μL of vaccine solution on the dorsal base of the tail followed by scratching the skin with an 18G needle. Serum samples of mice were collected at 3 and 6 weeks after vaccination (n=7). (b) Photographs showing the cutaneous reaction at the vaccination site inoculated by scarification. Notably, a more severe cutaneous reaction was observed after inoculation by scarification, and the scar remained at 4 weeks. Statistical significance compared to the no treatment sample was determined by a t-test (*$p < 0.05$, **$p < 0.01$, ***$p<0.005$).