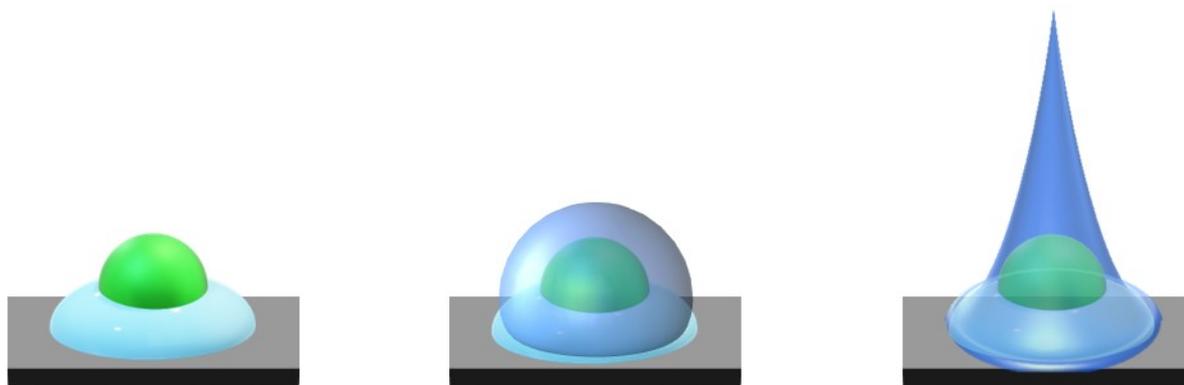
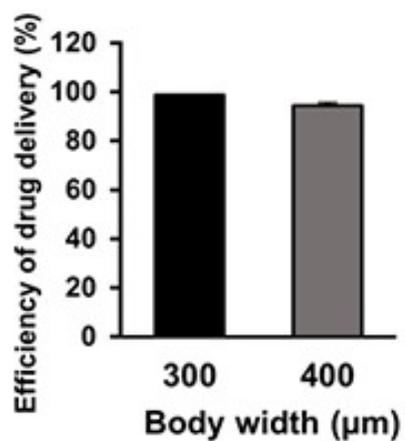


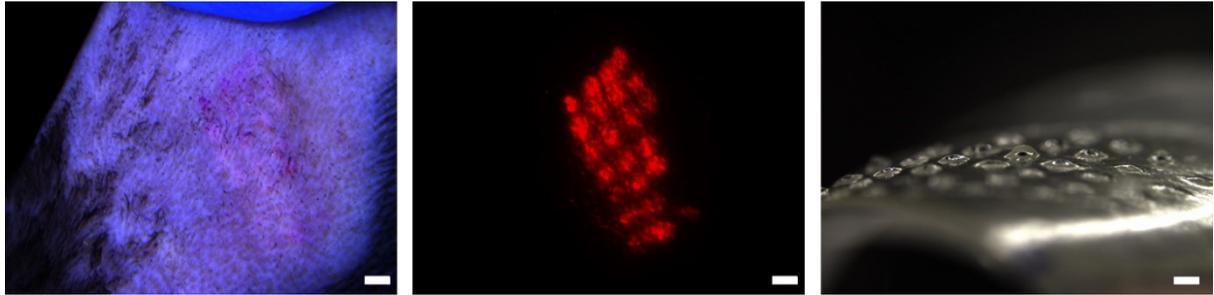
Supplementary Figures



Supplementary Figure 1. Schematic illustration of centrifugal lithography of TLM, where the microneedle is fabricated with centrifugal force after dispensing shield layer on core layer.



Supplementary Figure 2. *In vitro* efficiency of the drug delivery of TLMs with 300 and 400 μm body width. By measuring the degree of fluorescence remaining in the patch after insertion, the amount of the drug transmitted through the skin was inversely estimated. Data are the mean ± SEM (n=3).



Supplementary Figure 3. *In vivo* insertion of TLM into mouse dorsal skin for 30 seconds. (Left) Mouse dorsal skin area under microscope. (Middle) Mouse dorsal skin area under fluorescence microscope. (Right) Remains of TLM after insertion into mouse dorsal skin. (Scale bar, 1 mm)