

Supplementary Information:

**Autonomous wearable sweat rate monitoring based on digitized microbubble detection**

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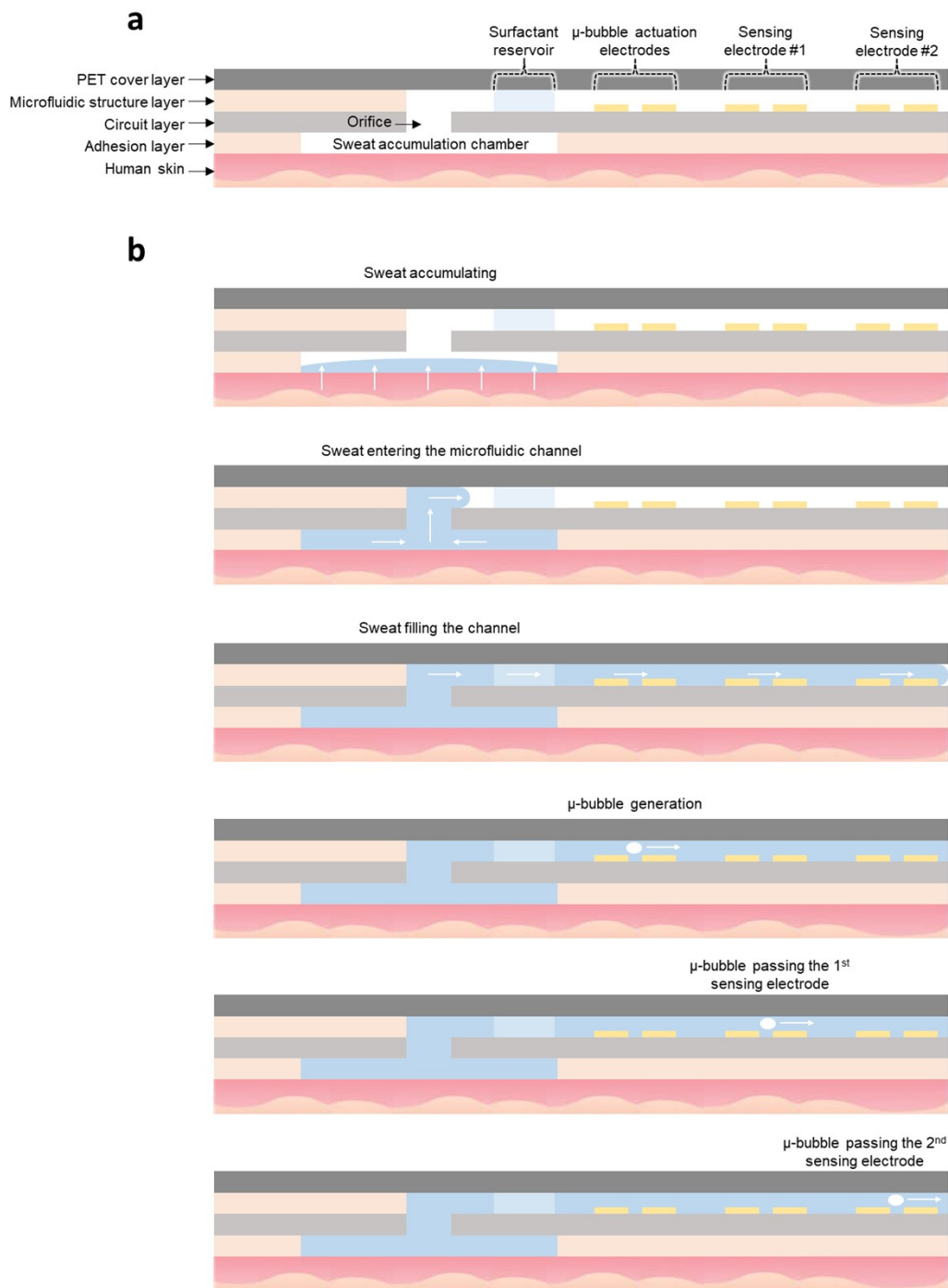
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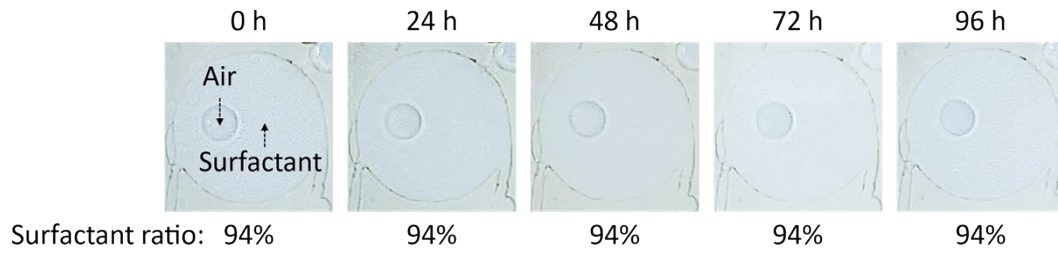
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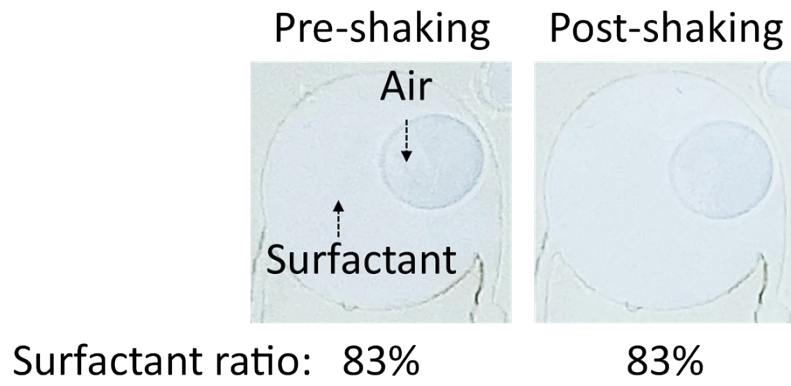
## Supplementary Figures:



**Supplementary Fig. 1.** a) Cross-view schematic of the device-epidermal interface. b) Overview of the sweat collection and sweat rate sensing process.



**Supplementary Fig. 2.** Optical images to demonstrate the preservation of surfactant over time. Surfactant ratio maintains at the same level for 96 hours.



**Supplementary Fig. 3.** Optical images to demonstrate the preservation of surfactant within the device under shaking. Surfactant ratio maintains at the same level before and after shaking (1000 rpm) of 2 hours.