Fabrication of PDMS artificial skin

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Artificial skin has been extensively studied recently, because it can be used not only in human body directly but also for the substrates of wearable devices. Flexibility and biocompatibility of the poly dimethylsiloxane (PDMS) membrane make it one of the most common tissue-mimicking materials. Recently, several researchers have showed that tubular and planar structures in tissues could be fabricated with PDMS membranes. Moreover, these membranes had a potential to be used as an artificial skin scaffold. For practical application, these thin PDMS membranes should be large, free-standing and easy to handle. Although several methods to fabricate free-standing ultra-thin PDMS membranes were already reported, the diameters of their membranes were limited to several millimeters. In this study, we fabricate free-standing thin PDMS membranes with large area using paraffin wax as a sacrificial layer. Moreover, we attach the ring-shaped PDMS binder to this membranes for easy handling and observation.