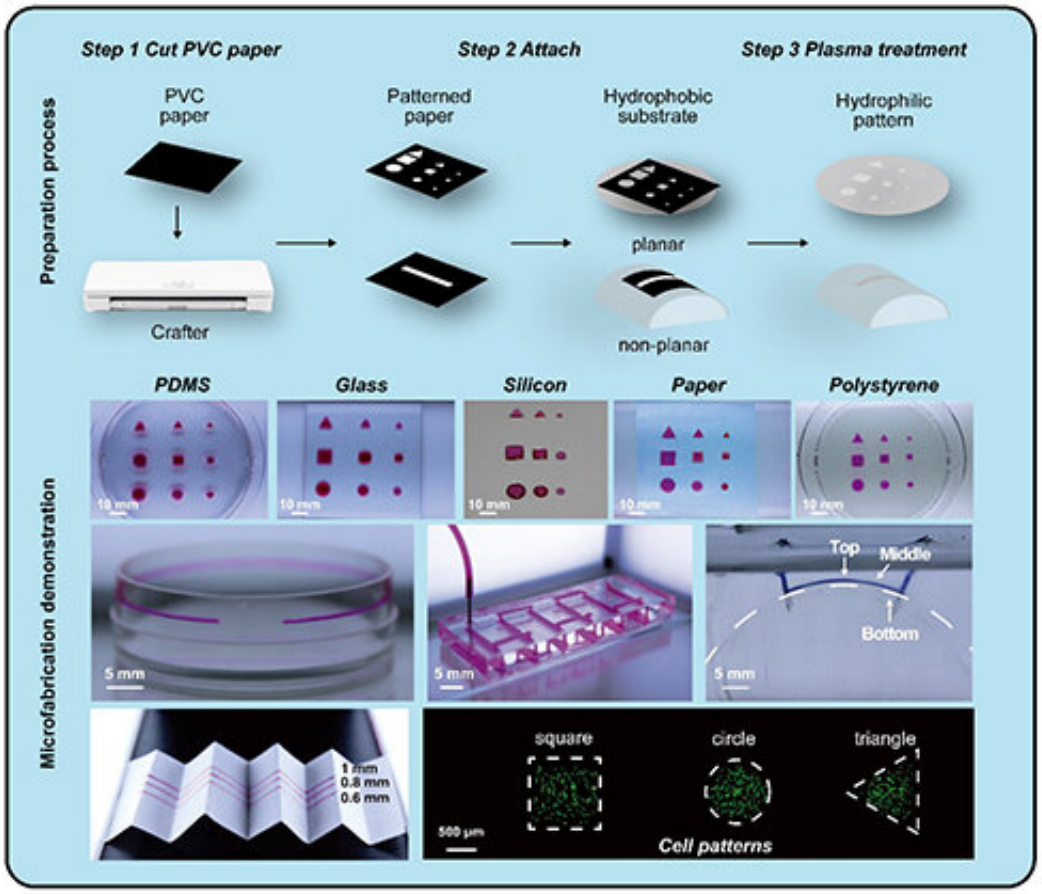
Facile method proposed for microfabrication on non-planar substrates

May 20 2021, by Li Yuan



Flexible hollow-out mask enabled the patterning of microscale hydrophilic/hydrophobic interface on different substrates. Credit: YAN Shiqiang

Most microfabrication technologies are focused on the planar surface.

On the non-planar surfaces, microfabrication technologies are limited by tedious preparation steps, requirement of bulky equipment, and unsatisfactory roughness of microstructures.

Recently, a group led by Prof. Lu Yao from the Dalian Institute of Chemical Physics (DICP) of the Chinese Academy of Sciences, in collaboration with Prof. Zhang Weijia from Fudan University, proposed a facile method for microfabrication on non-planar substrates.

This study was published in *Biofabrication* on April 2.

The method could achieve rapid prototyping of polydimethylsiloxane (PDMS) microdevices. "This is realized via microscale plasma-activated templating (μPLAT) on non-planar surfaces through micropatterning of hydrophilic/hydrophobic interface by flexible PVC hollow-out mask," said Prof. Lu.

The mask could be easily prepared with flexible PVC film through a cutting crafter and applied as a pattern definer during the plasma treatment for microscale hydrophilic/hydrophobic interface formation on different substrates. The whole process required low input of time as well as toxic chemicals.

Coupled with liquid molding, they demonstrated cell patterning on the curved substrate and the fabrication of PDMS microdevices on different substrates, including microchannels, micromixers, microwell arrays, PDMS lenses, spatially curved microchannel, multilayered microfluidics.

The study shows broader possibilities on different substrates for microdevices fabrication, cell patterning, and surface modification.

More information: Shiqiang Yan et al, Rapid prototyping of PDMS microdevices via μPLAT on nonplanar surfaces with flexible hollow-out

mask, *Biofabrication* (2021). DOI: 10.1088/1758-5090/abd9d8