**Patterned Photonic Nitrocellulose for Pseudo-Paper Microfluidics**

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A pseudo-paper microfluidic chip based on patterned photonic nitrocellulose is fabricated. The photonic nitrocellulose is fabricated using self-assembled monodisperse SiO2 nanoparticles as template. The SiO2 nanoparticles form a photonic crystal having a close-packed hexagonal structure in the microchannels, so the resulting nitrocellulose has a complementary inverse-opal structure. After lamination, a hollow channel is obtained that is partially filled with the photonic nitrocellulose. Owing to the highly ordered photonic structure of the pseudo-paper chip, the flow profile of aqueous solution wicking through the channel is more uniform than conventional paper microfluidic chip. It is also found that the wicking rate of aqueous solution can be easily manipulated by changing the diameter of the self-assembled monodisperse SiO2 nanoparticles, which determines the pore size of the photonic nitrocellulose. The fluorescent enhancement property of the photonic nitrocellulose is used to increase the fluorescent intensity for multiplex detection of two cancer biomarkers. Label-free etection of human immunoglobin G based on the structure color of the photonic nitrocellulose is also demonstrated.

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Figure 1. The patterned photonic nitrocellulose for pseudo-paper microfluidics.

**References**

1. Bingbing Gao, Hong Liu,\* and Zhongze Gu,\* “Patterned Photonic Nitrocellulose for Pseudo-Paper Microfluidics” **Anal. Chem.** , 2016, 88, 5424–5429.