Supplementary materials for

Reproducible fiber optofluidic laser for disposable and array applications

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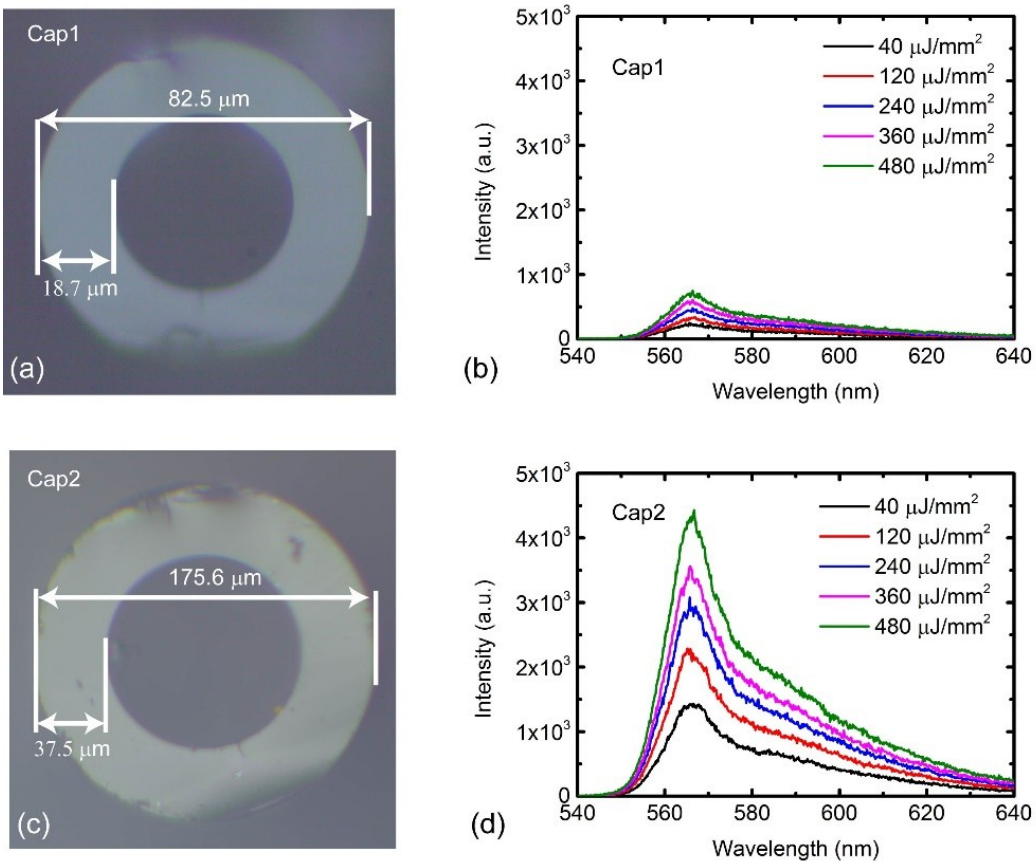

Figure S1 The microscopic images of two thinnest commercial capillaries from Vitrocom, (a) Cap1: Model 0508Q and (c) Cap2: Model 1017Q, with thickness of 18.7 μm and 37.5 μm, respectively. Corresponding emission spectra from (b) Cap1 and (d) Cap2 by using 1 mM R6G in ethanol as gain medium and pumping with a 532 nm pulsed laser; pump energy densities are also given. Not only a poor repoducibility in diameter (~ 10% fluctuation) was given by the manufacturer, but also no lasing was observed with pump as high as 480 μJ/mm^2.

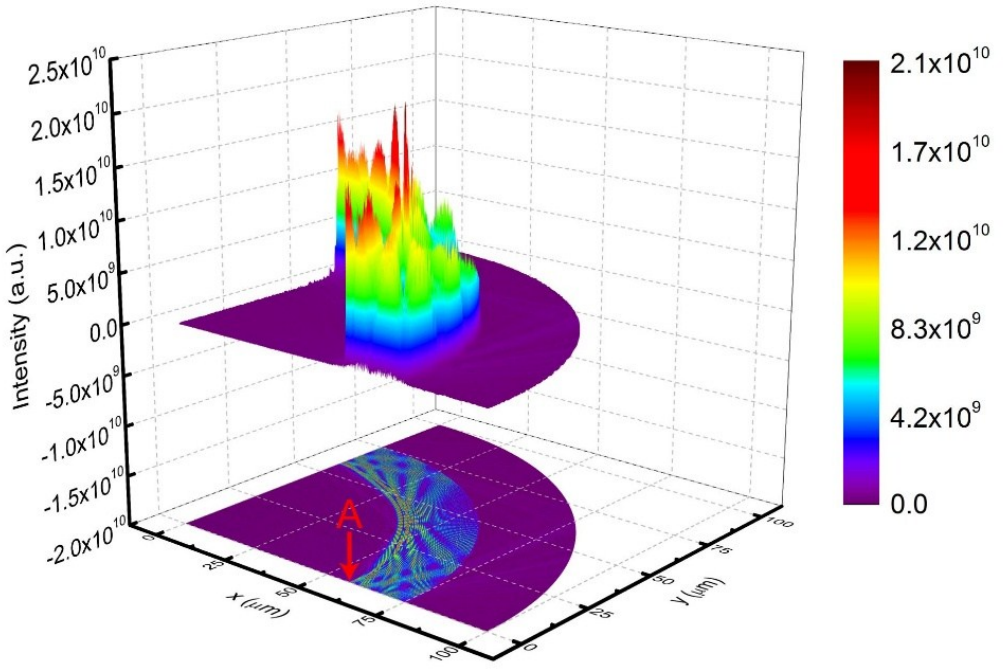

Figure S2 The intensity distribution in one quarter of the cross-section of MOF. The light source was located at A (x=57.5 μm, y=0 μm). Strong resonances and multi-modes of light were observed.

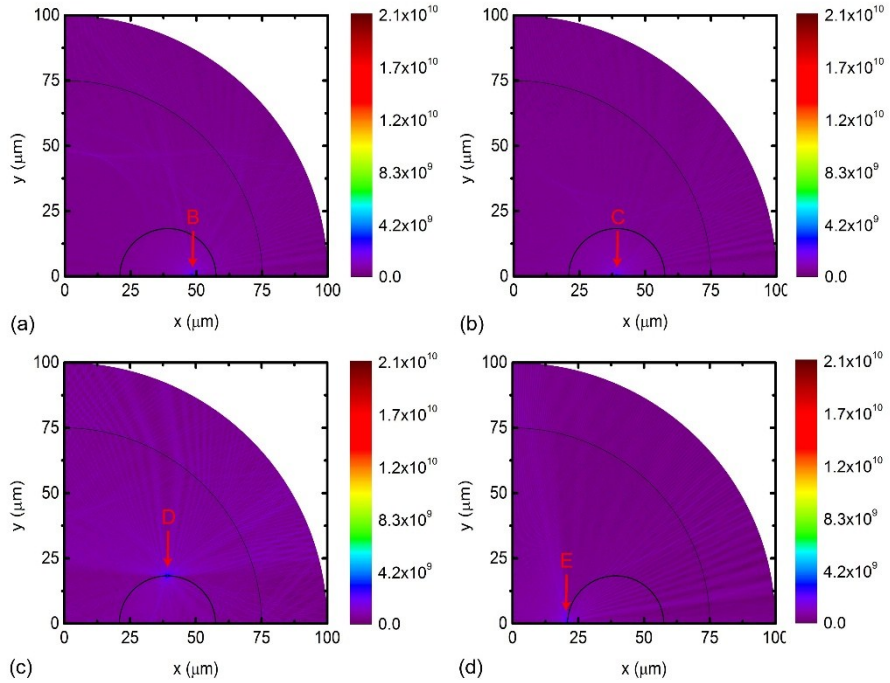

Figure S3 The intensity distribution in one quarter of the cross-section of MOF when the light source was located at (a) B (x= 48.35 μm, y=0 μm), (b) C (x= 39.2 μm, y=0 μm), (c) D (x= 39.2 μm, y=18.3 μm), (d) E (x= 20.9 μm, y=0 μm). No resonances were observed.

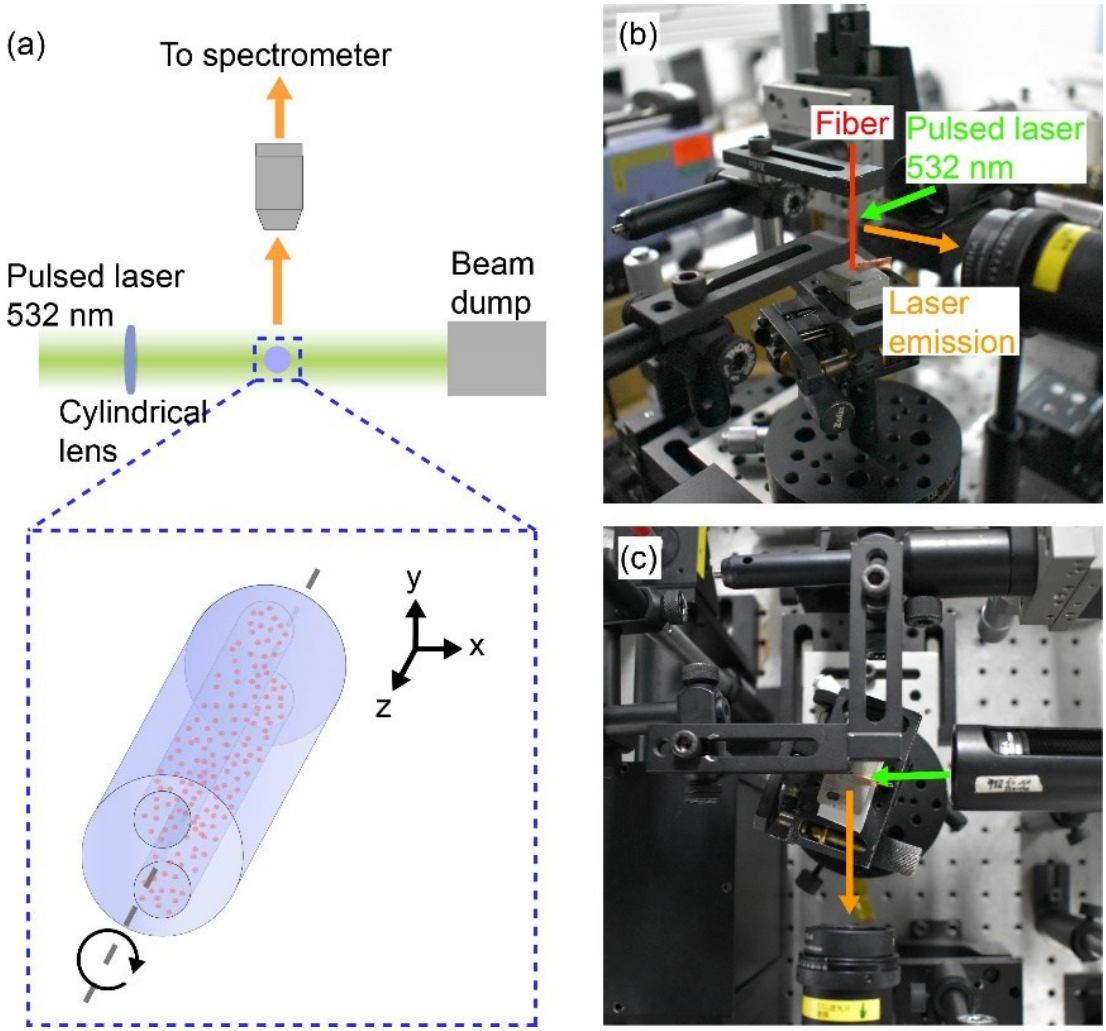

Figure S4 (a) Schematic diagram and (b)-(c) photos of the experimental setup, (b) side view and (c) top view.

Cost calculation for the disposable MOF

The total cost for fabricating 3 km of MOF is <$2600, including <$100 for a section of silica rod which is sufficient for 3km MOF, <$1500 for hole drilling and processing of the rod, and <$1000 for the MOF drawing. The MOF can be made with cost lower than 1$ per meter. Therefore, the cost of a 3-cm section of MOF is very low (<0.03 USD).

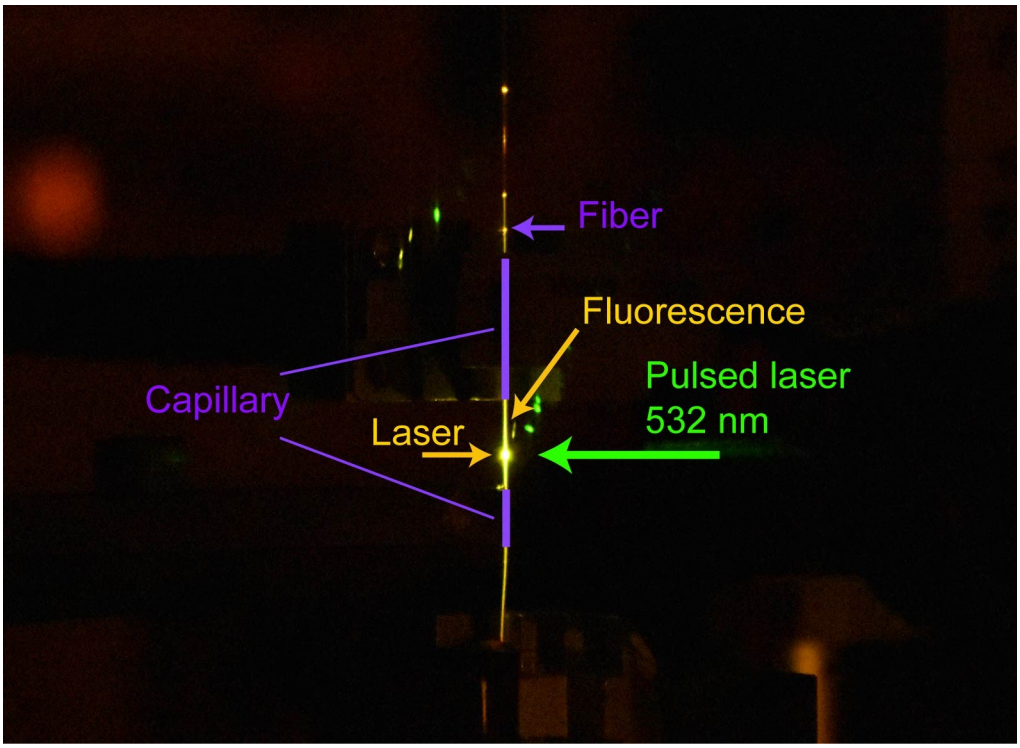

Figure S5 A photo of the fiber optofluidic laser.