

ELECTRONIC SUPPLEMENTARY INFORMATION

Title: A class of low voltage, elastomer-metal ‘wet’ actuators for use in high-density microfluidics

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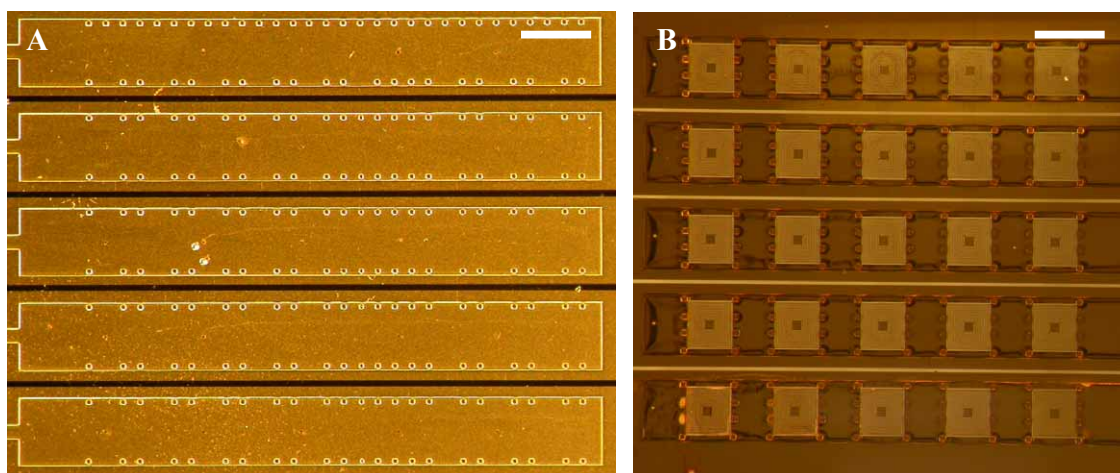


Fig. S1 A) 5 x 5 array of all-gold roof devices B) 5 x 5 array of elastomer-metal devices. In both arrays, five 6 mm microchannels (in rows) each contained five valve devices. Scale bar is 600 μm .

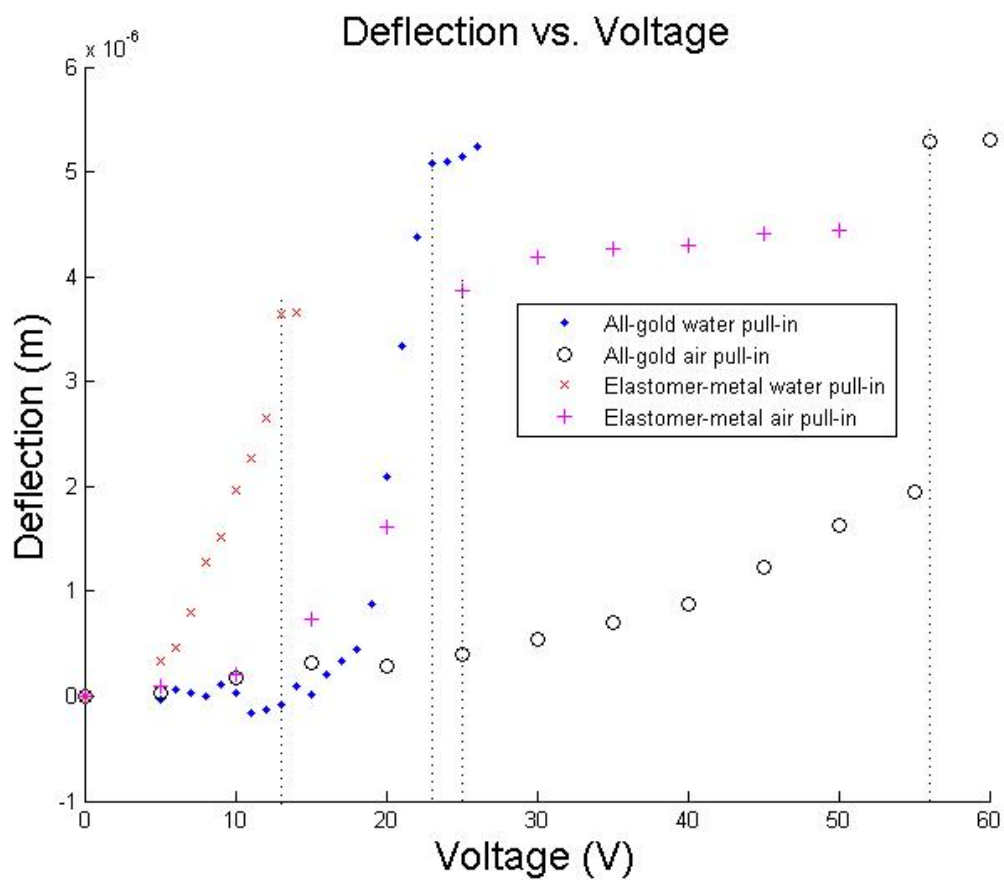


Fig. S2 Deflection vs. voltage plot for all-gold and elastomer-metal devices. Pull-in is indicated on each plot with dashed lines.

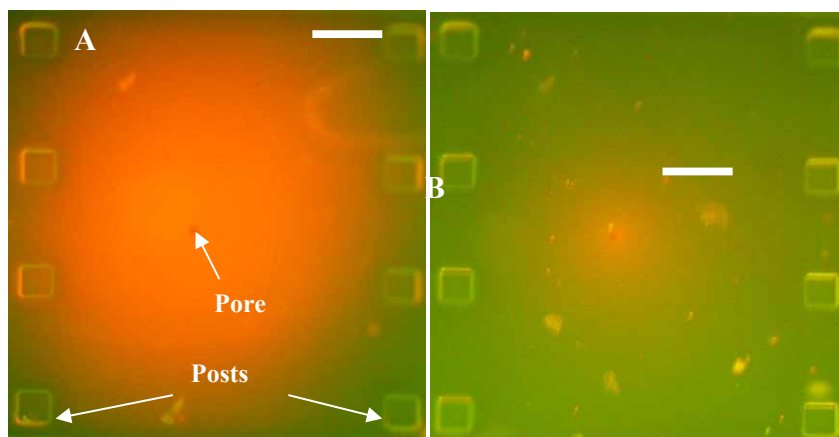


Fig. S3 Elastomer-metal devices can be used as drug dosers. A) An unactuated device with an etched hole at its center can behave as an open pore and diffuse chemicals into medium B) An actuated valve can close the pore and stop the diffusion [19]. Scale bar is 100 μm .

Microscopy and electrical setup

Upright and inverted microscopy was done with a ZEISS Axioskop and a Nikon TE2000, respectively. Surface profilometry was carried out using a Zygo New View 5000. For fluorescent imaging and dosing, a mixture of de-ionized water and a Tris(2,2'-bipyridyl)dichlororuthenium(II) hexahydrate (Sigma) fluorophore was loaded in a reservoir and entered the microchannels through capillary action. Devices were also filled and actuated with silicone oil (data not shown). DC voltages were applied using a Keithley 2400 Sourcemeter. AC voltages were applied with an Agilent 33250A Function/Arbitrary Waveform Generator, 80 MHz.