

Supporting information for

Robust ionic current sensor for bacterial cell size detection

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Supplementary Figures S1, S2, S3, and S4

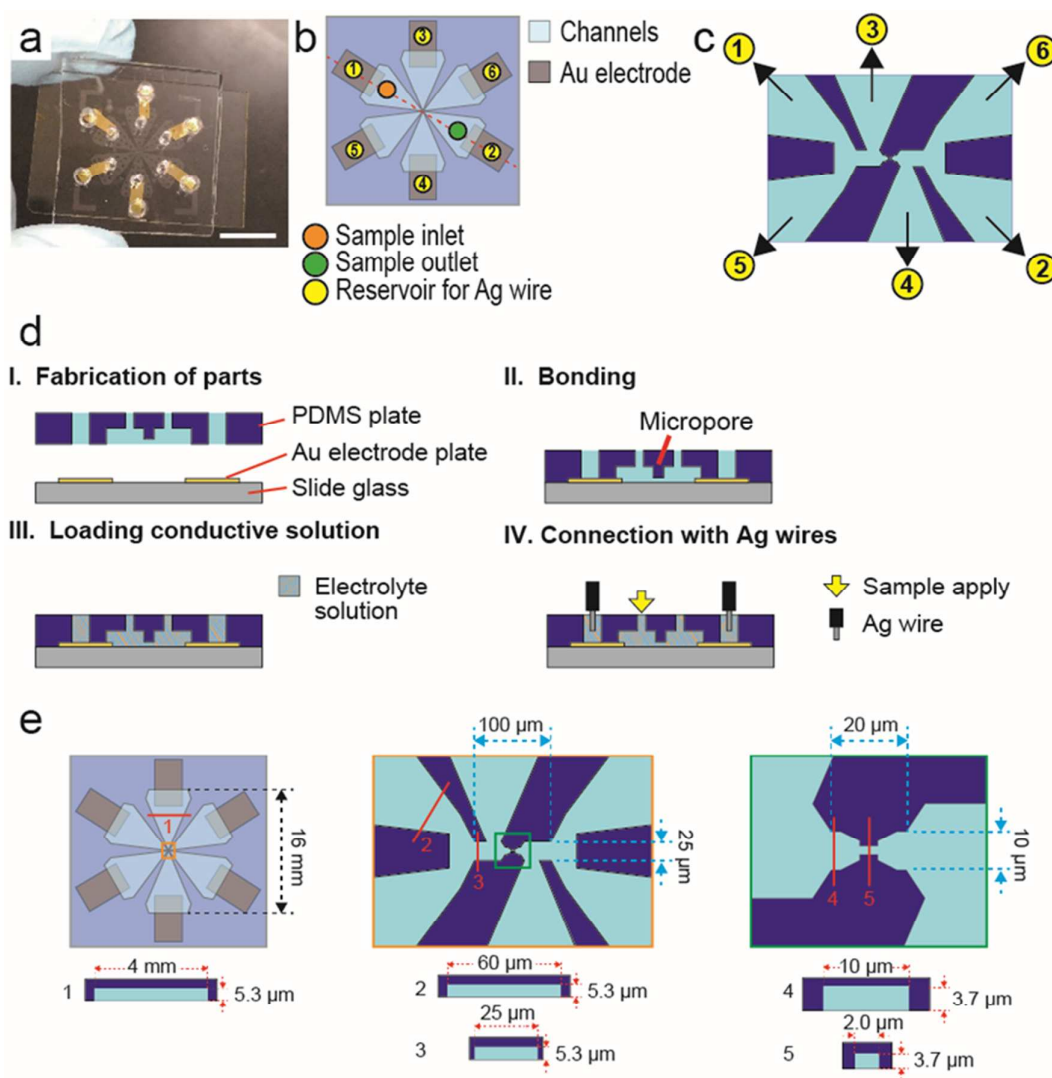


Figure S1. Schematic illustrations of the micropore chip and its fabrication process. (a) Photo of the micropore chip; scale bar, 1 cm. (b) Design drawing. (c) Schematic illustration of the center of the micropore chip. Six channels are connected to Au electrode plates which are numbered as shown in Fig. S1b. (d) Fabrication process. All process illustrations show cross-sectional views along the red dashed line in Fig. S1b. (e) A layout of chip design. The upper three illustrations show dimensions of the whole chip (left), an enlarged view (middle), and a further enlarged view (right). The lower five illustrations show dimensions of the five cross-sectional view lines indicated in the upper illustrations.

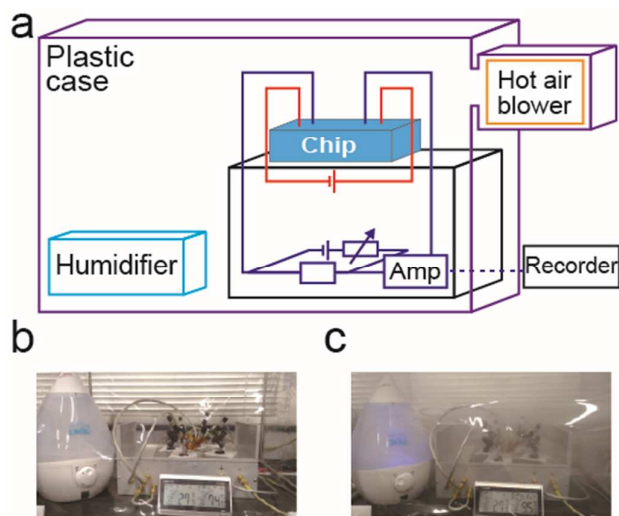


Figure S2. Experimental setup for changing temperature and humidity. (a) Schematic illustration of experimental setup. The hot air blower and humidifier were used for changing temperature and humidity, respectively. They were placed along with the chip (Robust-ICS) in a plastic case to maintain the desired conditions. (b) Photo of the setup at 27 °C and humidity of 74%. (c) Photo of the setup at 27 °C and humidity of 95%.

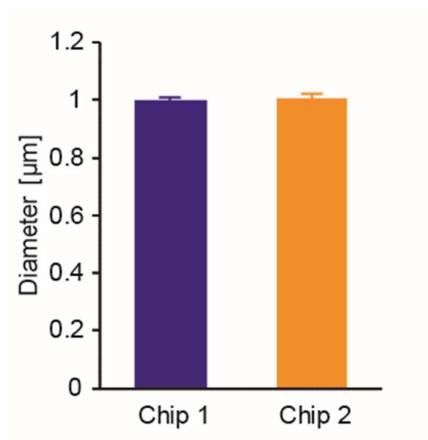


Figure S3. Repeatability of particle size detection. Repeatability of particle size detection was tested by using 2 different PDMS chips fabricated from the same mold. Sample particles were 1.00 μm in diameter. Diameters detected by chip 1 and chip 2 were 1.00 ± 0.01 μm and 1.00 ± 0.02 μm, respectively. Error bars show the standard deviation for a series of measurements (N = 200).

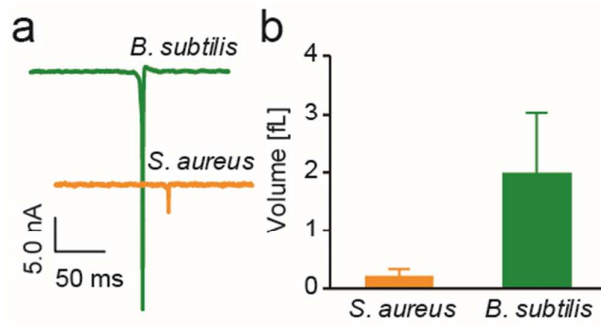


Figure S4. Comparison of detected volume of two different species of bacteria. (a) Signals of *S. aureus* (orange line) and *B. subtilis* (green line). (b) Comparison of detected volume of each bacterium. Error bars show the standard deviation for a series of measurements (N = 200).