Electronic Supplementary Material (ESI) for Lab on a Chip
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Supplementary Information

A 1052-sample serum analyzer chip for cancer diagnostics

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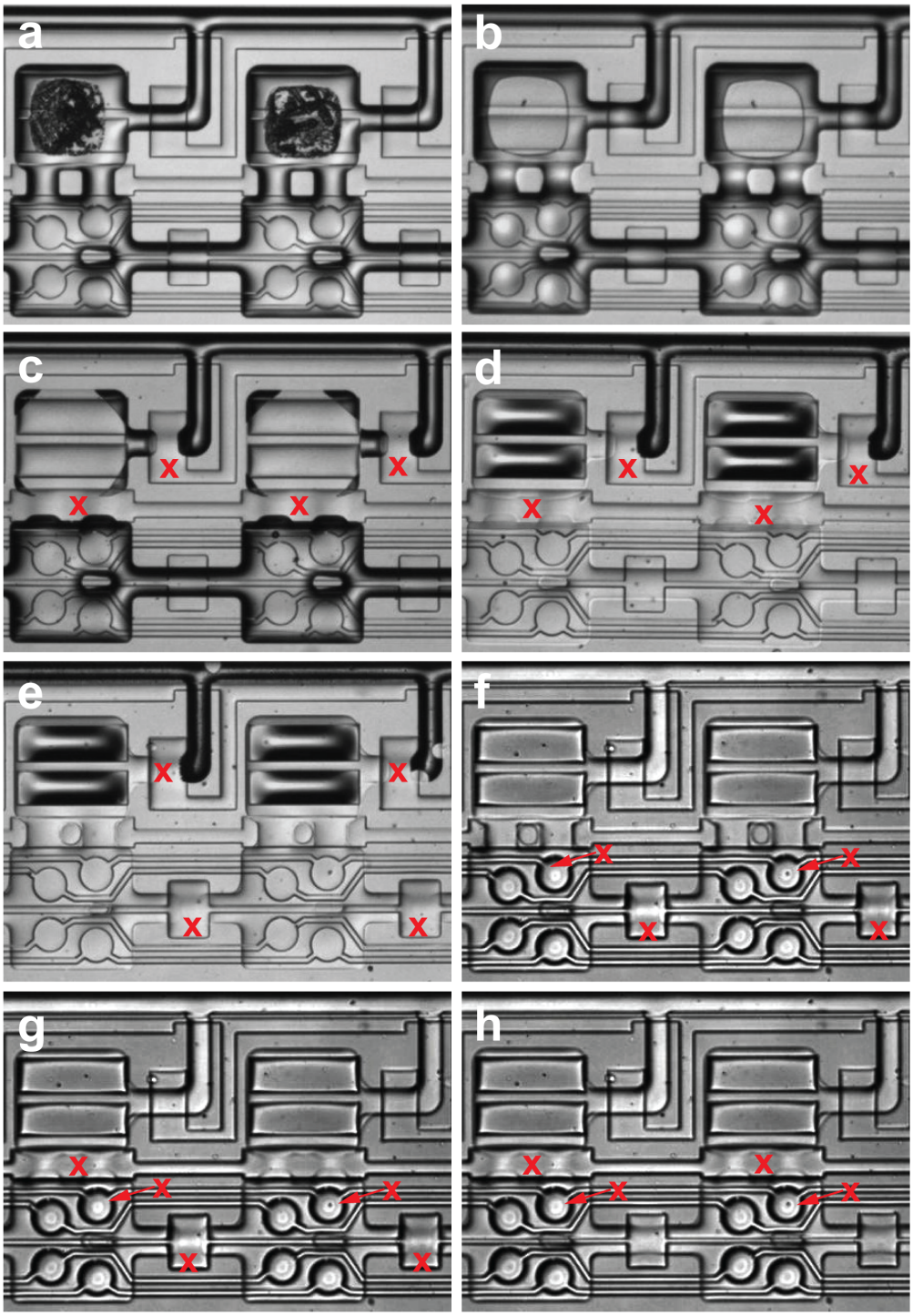

Supplementary Figure 1. Sequence of photographs of two assay units showing the operation of the device. x denotes valve closed. (**a**) Spotted samples on glass are aligned to the PDMS chip. (**b**) Control lines are primed at low pressure (~5 psi) and the spotted sample starts to rehydrate. (**c**) The pressure is increased to ~23 psi and the neck and relief valves are closed. Notice the increase in volume of the spotted sample. (**d**) Surface passivation is started by flowing different reagents in the assay chamber. (**e**) Sandwich valves are closed while the neck valve is open for the incubation step. (**g**) After the incubation step, the button membranes are closed and the relief valve open. (**h**) The neck valves are closed and the sandwich valves opened before the washing step.

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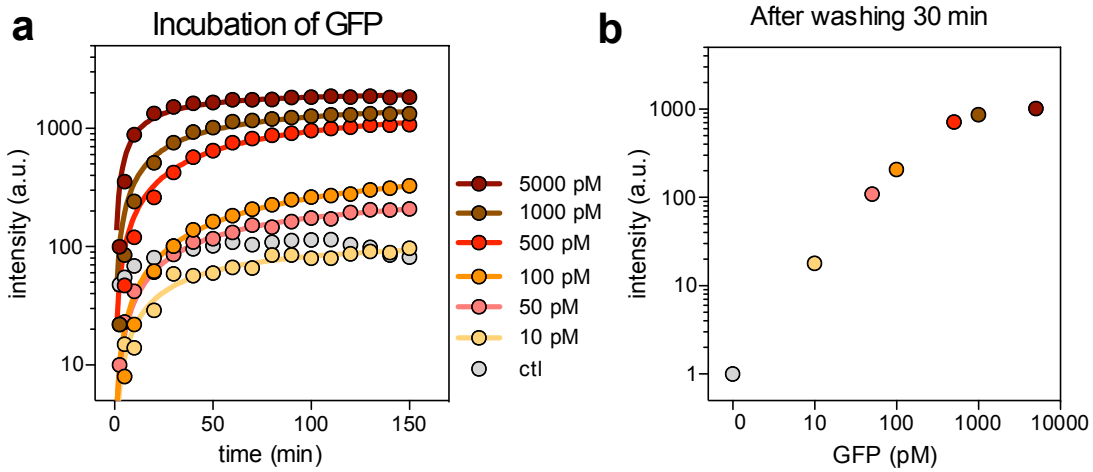
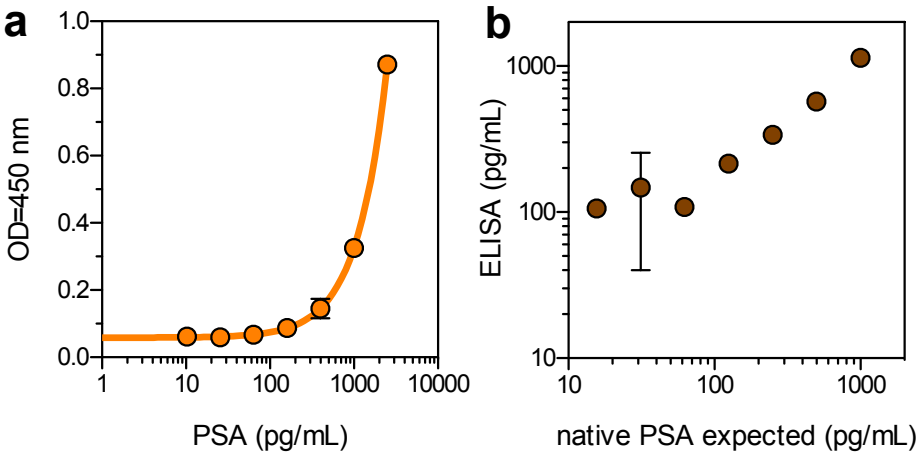


Supplementary Figure 2. Incubation time optimization. GFP was spotted at different concentrations (10 pM-5000pM), incubated, and captured on one button membrane using an anti-GFP antibody. (**a**) Response curve for the different concentrations. Chip was scanned every 10 min. (**b**) Quantitation of fluorescence after washing for 30 min with the button closed.



Supplementary Figure 3. ELISA results. (**a**) Standard curve of the Human PSA total ELISA performed in our lab. (**b**) Comparison of the native PSA human protein (Fitzgerald) as measured in the same ELISA to the reported values by the manufacturer. The native PSA human protein was the only one spotted on the chip.

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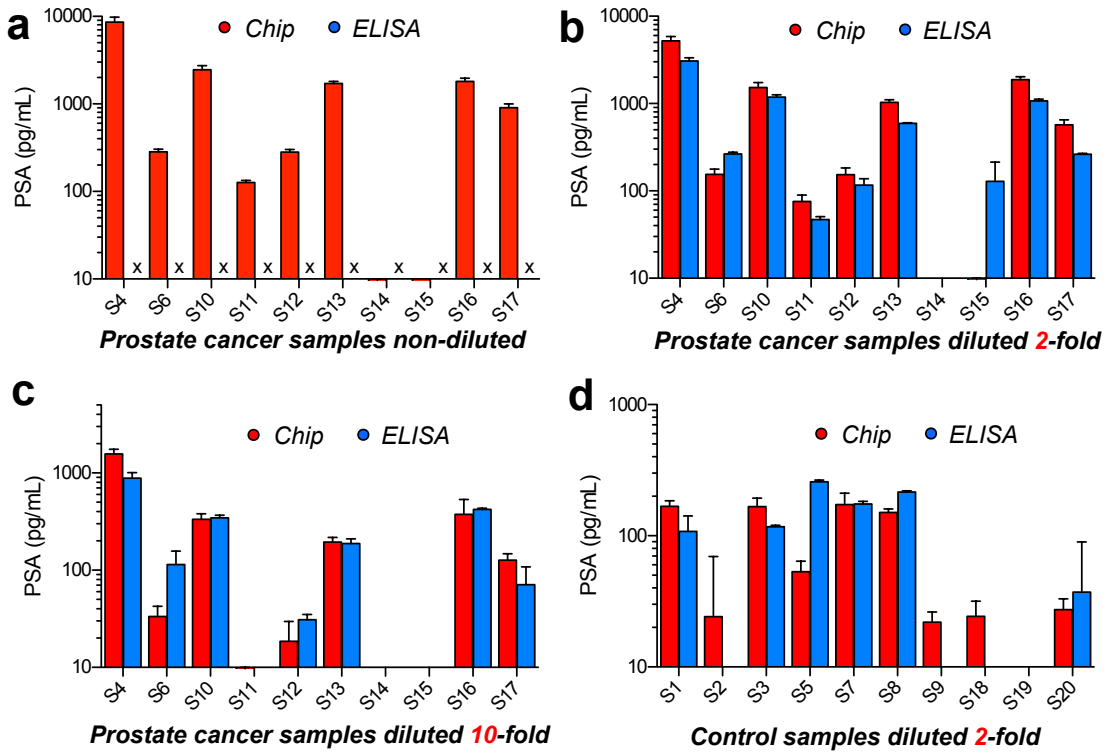

Supplementary Figure 4. Comparison of PSA values measured with the chip and a conventional ELISA. (a) Analysis of prostate cancer samples without diluting them using the chip. The ELISA kit manufacturer recommends diluting the sample at least 2-fold for optimal results; x denotes no ELISA measurements. Comparison of 2-fold (b) and 10-fold (c) diluted samples of prostate cancer patients and. (d) Comparison of 2-fold dilution of control samples. Error bars: 1 s.d, n=5 for the chip and n=2 for ELISA.

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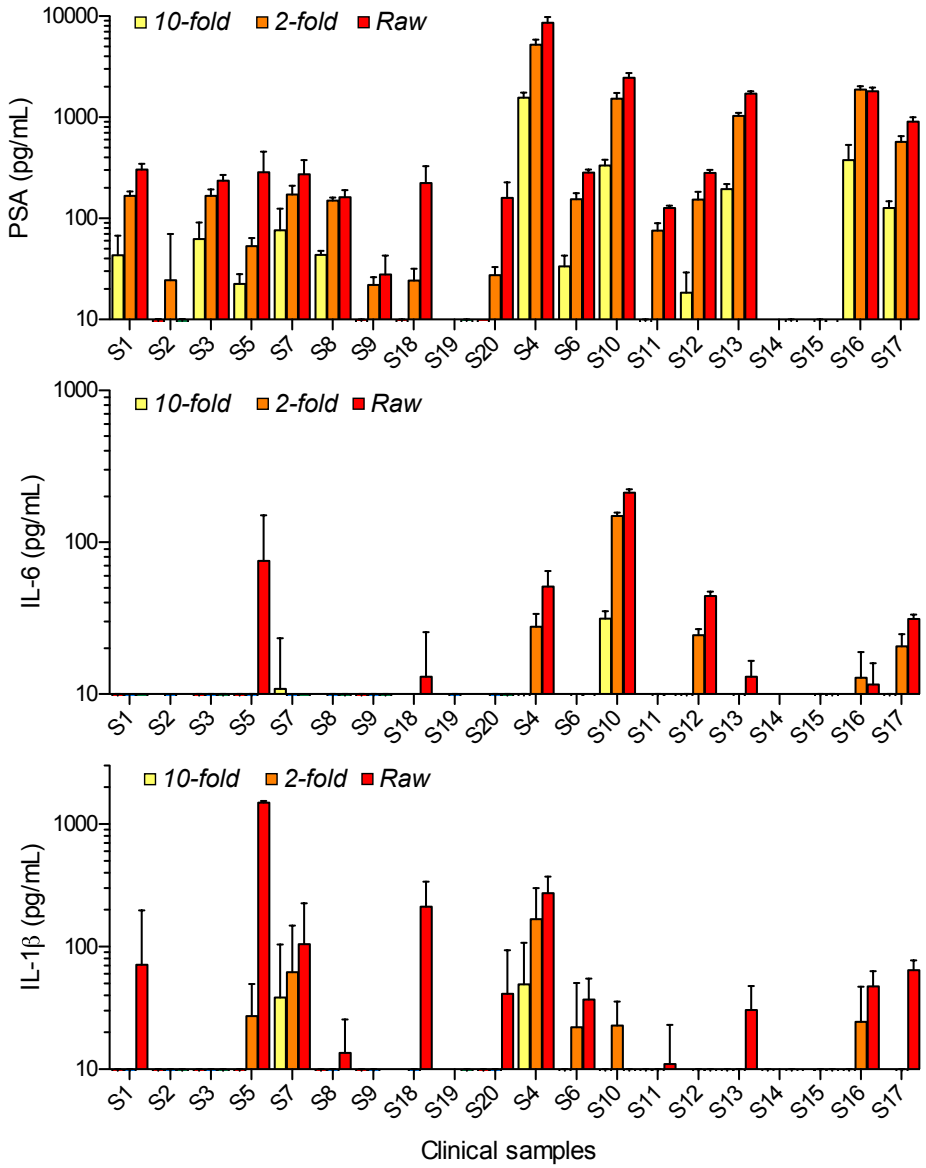

Supplementary Figure 5. Quantitation of the biomarkers concentrations for the 20 clinical serum samples with the chips. Samples were spotted either raw (red), 2-fold (orange), or 10-fold (yellow) diluted on the chip.