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

Supporting Information

Three-dimensional origami paper-based device for portable immunoassay applications

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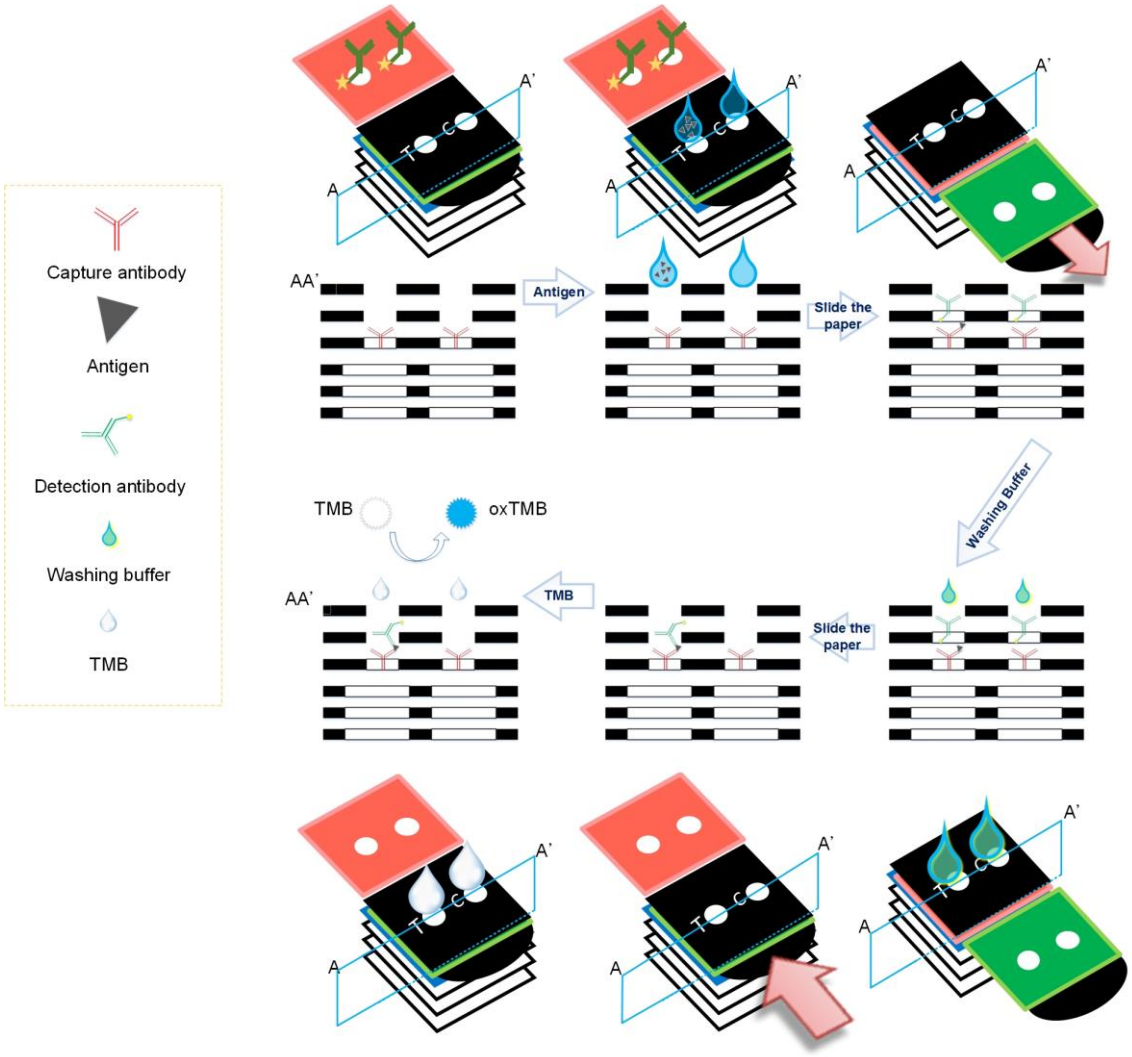

Fig. S1 The experimental operation procedure. The sample solution is first added to the prepared detection wells. After pulling the tab down, the binding region (orange layer, containing the antibody-HRP conjugate wells) slides down beneath the C and T well windows (black layer), followed by the addition of PBS buffer solution, which rinses the detection antibodies down into the underlying detection layer (blue tab). After sliding back to the initial position, TMB is added to the C and T wells to induce the color change of the ELISA assay and the colorimetric images are recorded using a smartphone or hand-held microscope after 5 min color development.

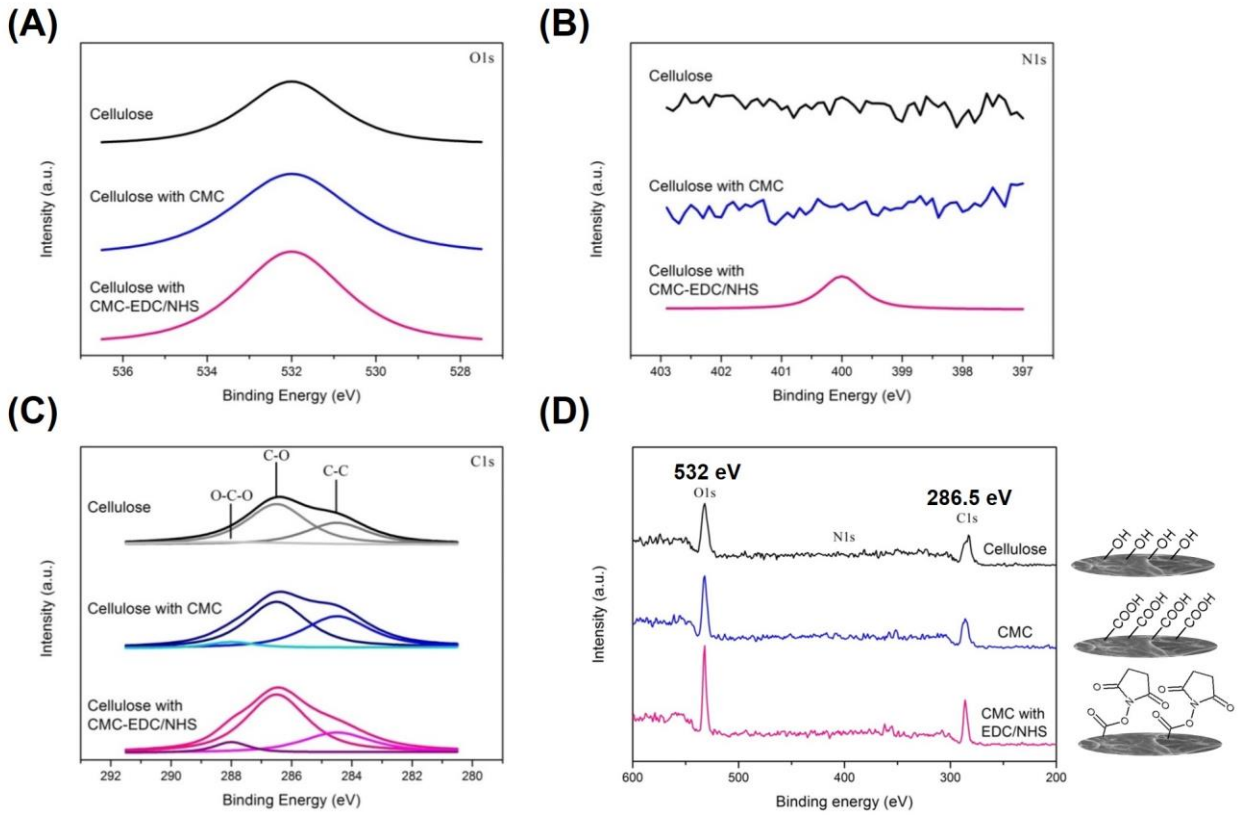

Fig. S2 XPS analysis of the surface modification cellulose substrate. The general O1s (A), N1s (B), C1s (C), and full XPS (D) spectra of the unmodified PAD, followed by CMC and EDC/NHS treatments, respectively. The O1s (532 eV) and C1s (286.5 eV) peaks suggest the COO^- functional group was enhanced on the surface of the cellulose after CMC modification. After EDC/NHS treatment, the NHS ester group can be found by the appearance of the N1s peak (400 eV).

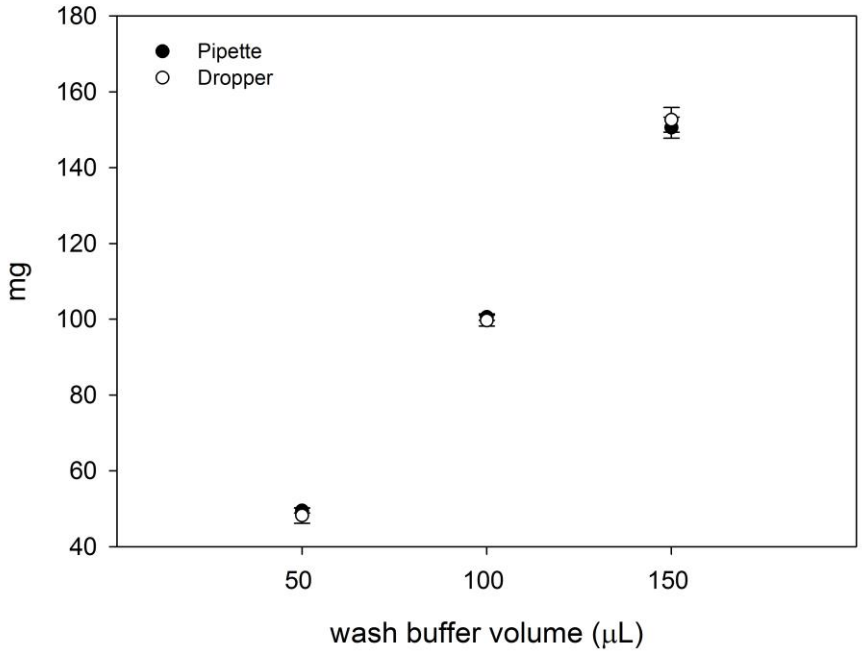

Fig. S3 The reproducibility of a small plastic dropper compared to a pipette. The same amounts of water, including 50 μL, 100 μL, and 150 μL, were drawn by a plastic dropper and pipette, and then we weighed the materials on a scale to determine the added weight of the solution. The results show that the error percentages (%) of the pipette were about -0.96%, 0.54%, and 0.39% for the 50, 100, and 150 μL pipetted amounts of water, respectively. For the plastic dropper, the error percentages (%) were -3.62, -0.37, and 1.75% for 50, 100, and 150 μL amounts of water, respectively.