

## Supplementary Information

# A glass fiber sheet-based electroosmotic lateral flow immunoassay for point-of-care testing

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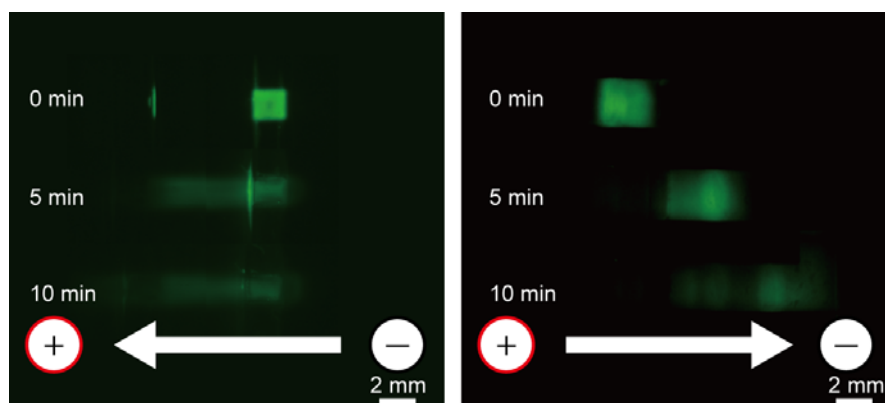
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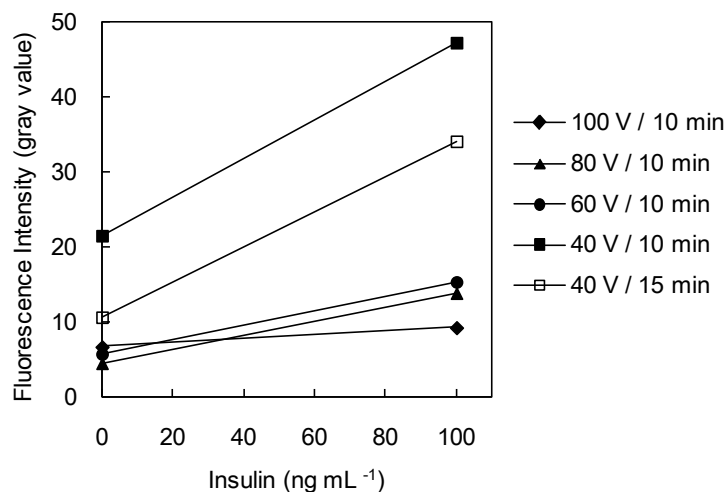
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## Supplementary Figures



**Figure S1 Migration directions of a fluorescently labeled antibody in an agarose gel system and a glass fiber sheet-based chip under DC voltage.**

**Left:** On a 1% agarose/1× TBE gel system, the fluorescently labeled anti-insulin antibody, which has a negative net charge, migrated from the cathode to the anode under 100 V DC. The migration direction and rate of migration of the target molecules depend on the charge of the molecules. **Right:** On the glass fiber sheet chip soaked in 1× TBE, the EOF became dominant and the antibody migrated toward the cathode under 100 V DC. By the dominance of EOF in the glass fiber sheet, we are able to control the direction of movement of the target molecules and consistently direct them toward the cathode, regardless of their net charge.



**Figure S2 Relationship between the bound/free separation efficiency and the DC voltage applied for EOF on the developed chip.**

A quantitative immunoassay for insulin was performed at 0 and 100 ng mL<sup>-1</sup> using the developed chip. The time required for the target antigen and the fluorescently labeled antibody to react depends on the EOF rate. When the assay was performed at 40, 60, 80, and 100 V DC for 10 min, the fluorescence intensity decreased with the increase in applied voltage because of the shorter reaction times at faster EOF rates. However, the washing process was not sufficient to remove background after the application of 40 V for 10 min, as shown by the high background intensity without insulin. When the washing process was extended by 5 min for the 40 V condition, the background intensity decreased significantly and the B/F separation was performing at its most efficient level.