

Supplementary Information

# Immunoblot-based optical biosensor for screening of osteoarthritis using a smartphone-embedded illuminometer

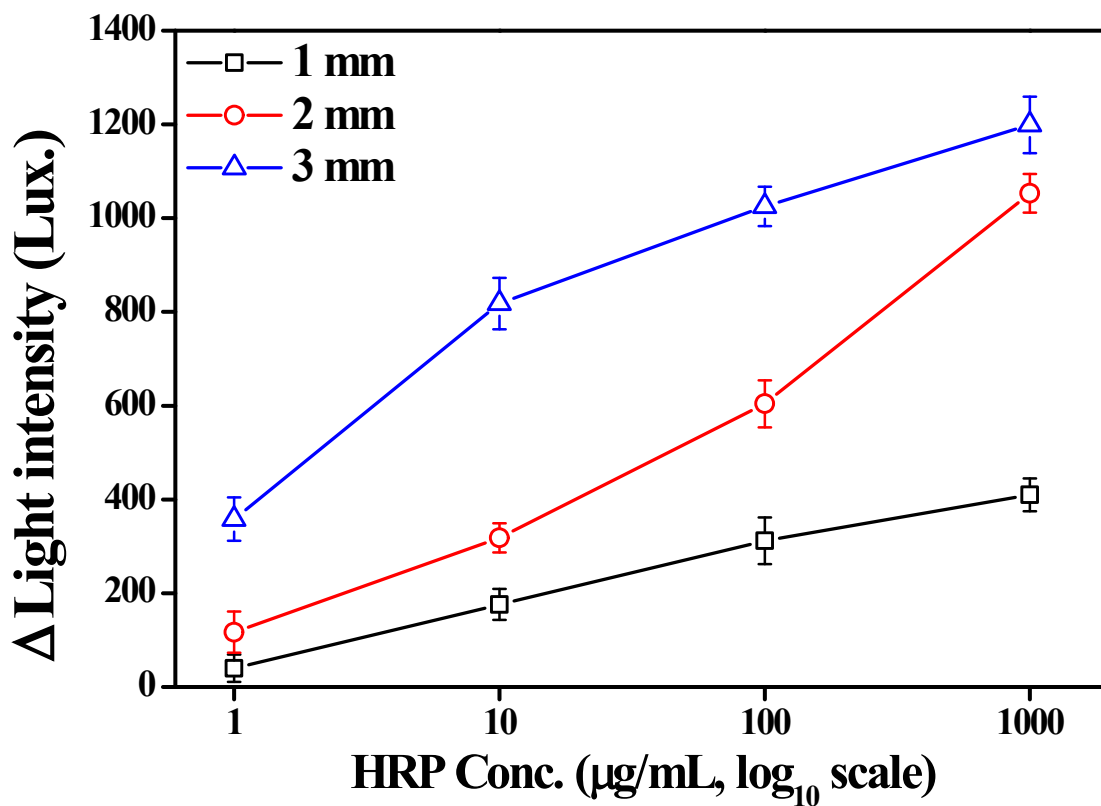
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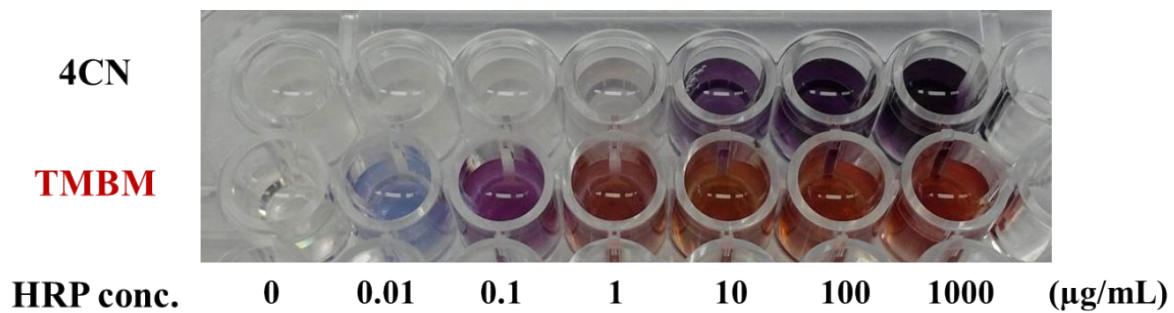
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**Figure S1.** Effect of the reaction channel depth for the HRP-mediated assay. Reaction chambers having different channel depths (1, 2 and 3 mm) were compared. Measurements were performed for different HRP concentrations in the presence of 1% H<sub>2</sub>O<sub>2</sub> and 1 mM 4-CN in 0.1 M PBS (pH 7.2). The mean of independent triplicate analyses is shown, and an error bar indicates a standard deviation. An approximately linear calibration curve with significant signal change was obtained from the reaction channel of 2 mm depth (20 mm in length x 5 mm in width x 2 mm in depth).



**Figure S2.** The results of the 4-CN/HRP and TMBM/HRP colourimetric assays. HRP was assayed in a range of concentrations from 0 to 1,000  $\mu\text{g/mL}$ .



**Figure S3.** Obtained optical images of the uCTX-II assay, and measurement using the developed illumination sensor.

