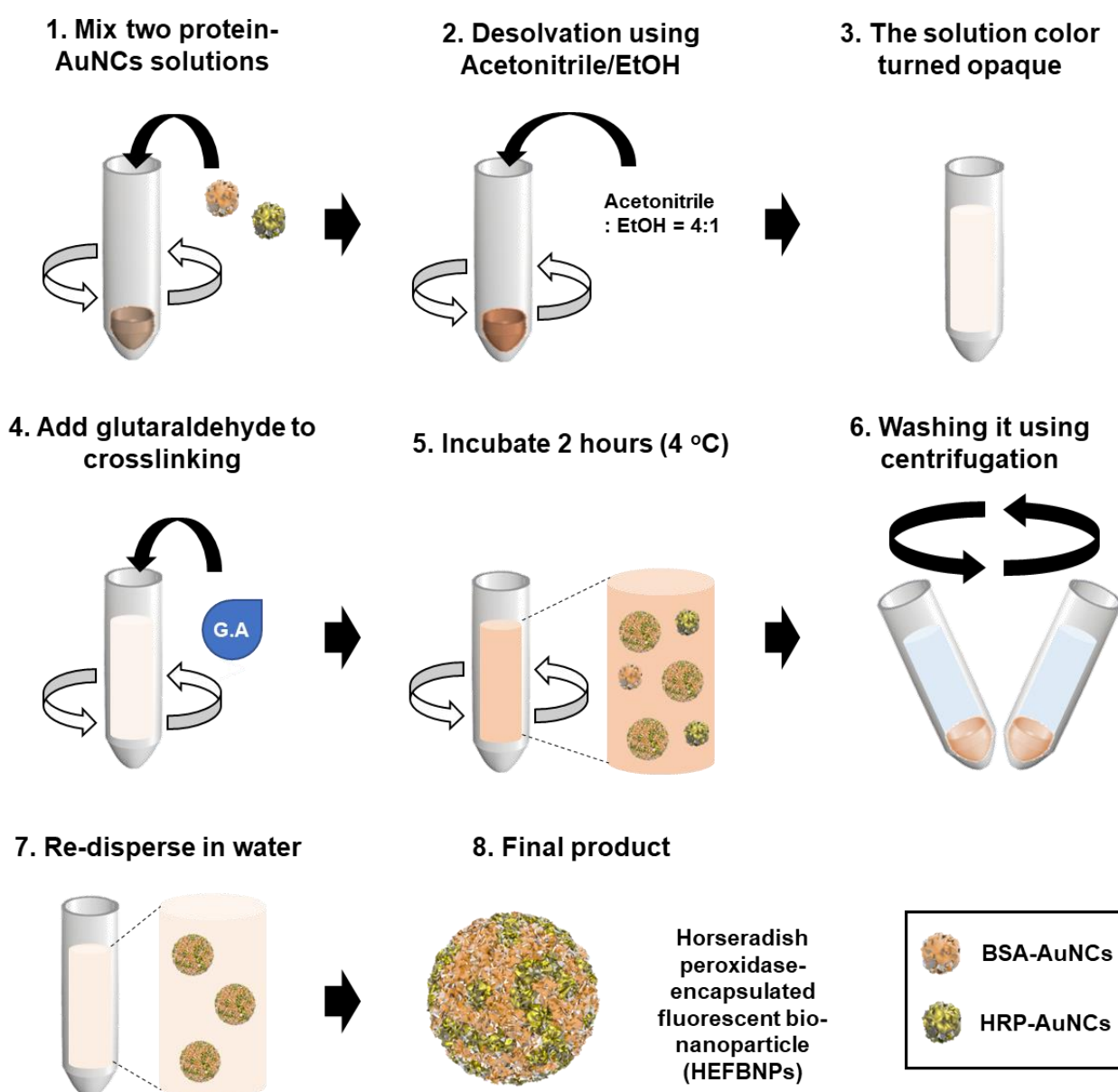


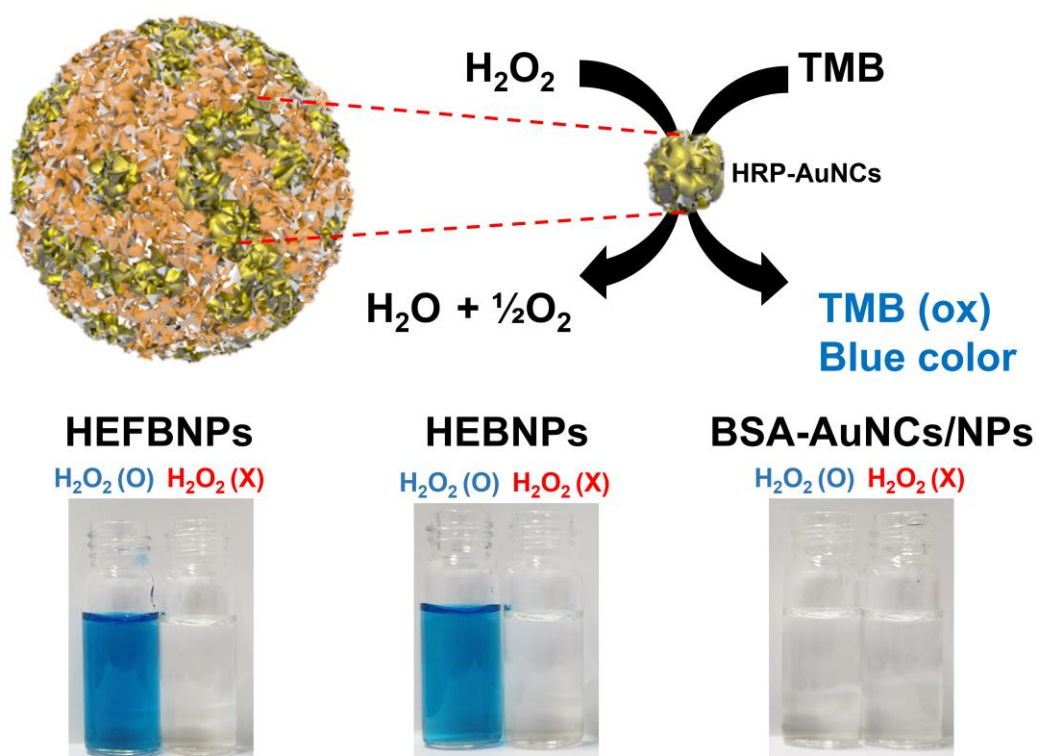
Supporting Information

# Horseradish Peroxidase-Encapsulated Fluorescent Bio-Nanoparticle for Ultra-Sensitive and Easy Detection of Hydrogen Peroxide

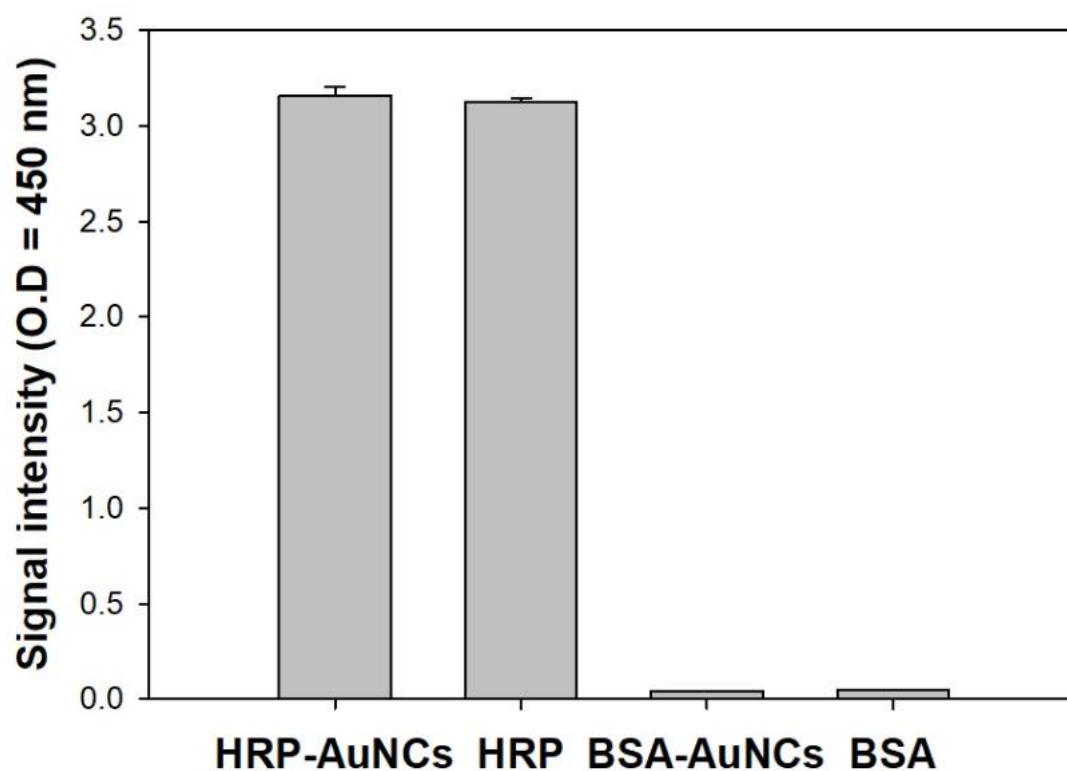
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**Figure S1.** Synthesis procedure of HEFBNPs by desolvation and cross-linking methods.



**Figure S2.** Encapsulated HRP-AuNC within HEFBNP via crosslinking process with HRP-AuNC and BSA-AuNC mixture.



**Figure S3.** Comparison enzymatic reaction of materials in HEFBNPs (n=3).

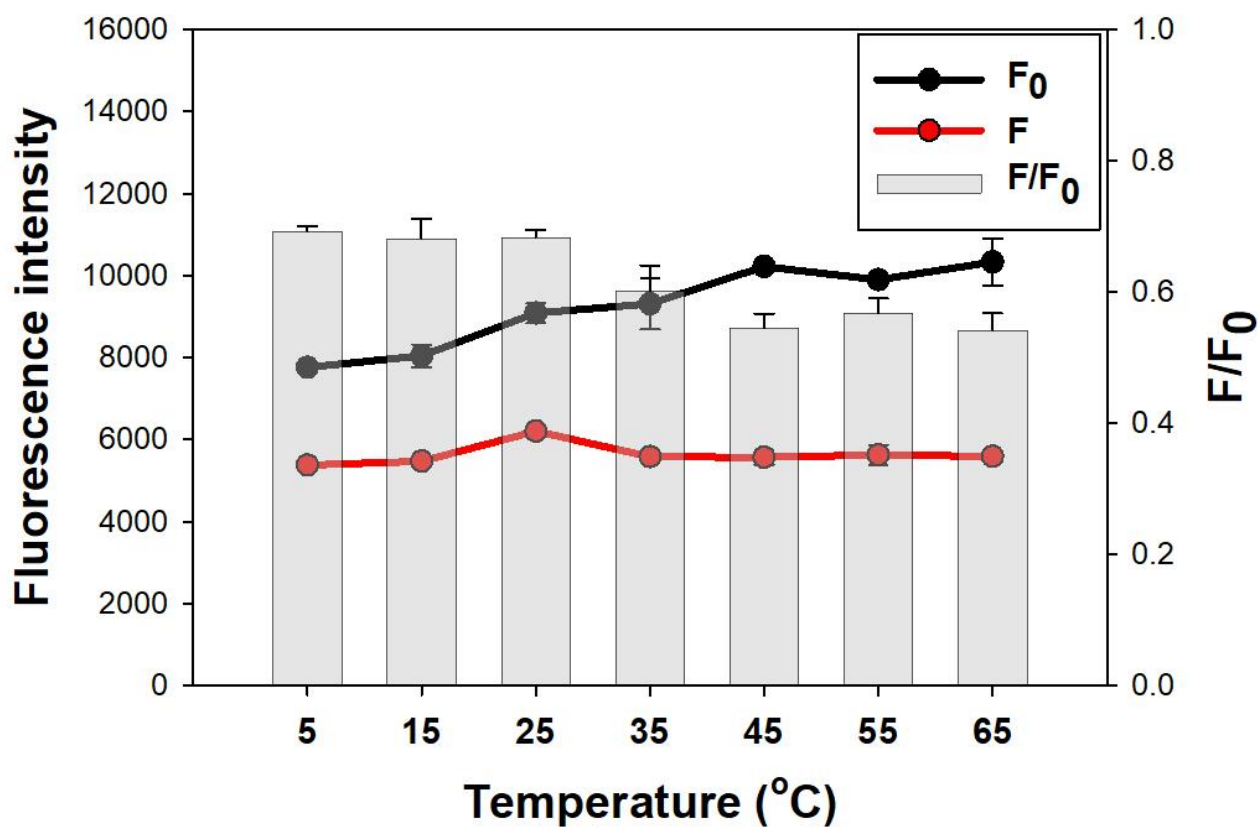


Figure S4. Influence of temperature on the detection of  $\text{H}_2\text{O}_2$  using HEFBNPs ( $n=3$ ).

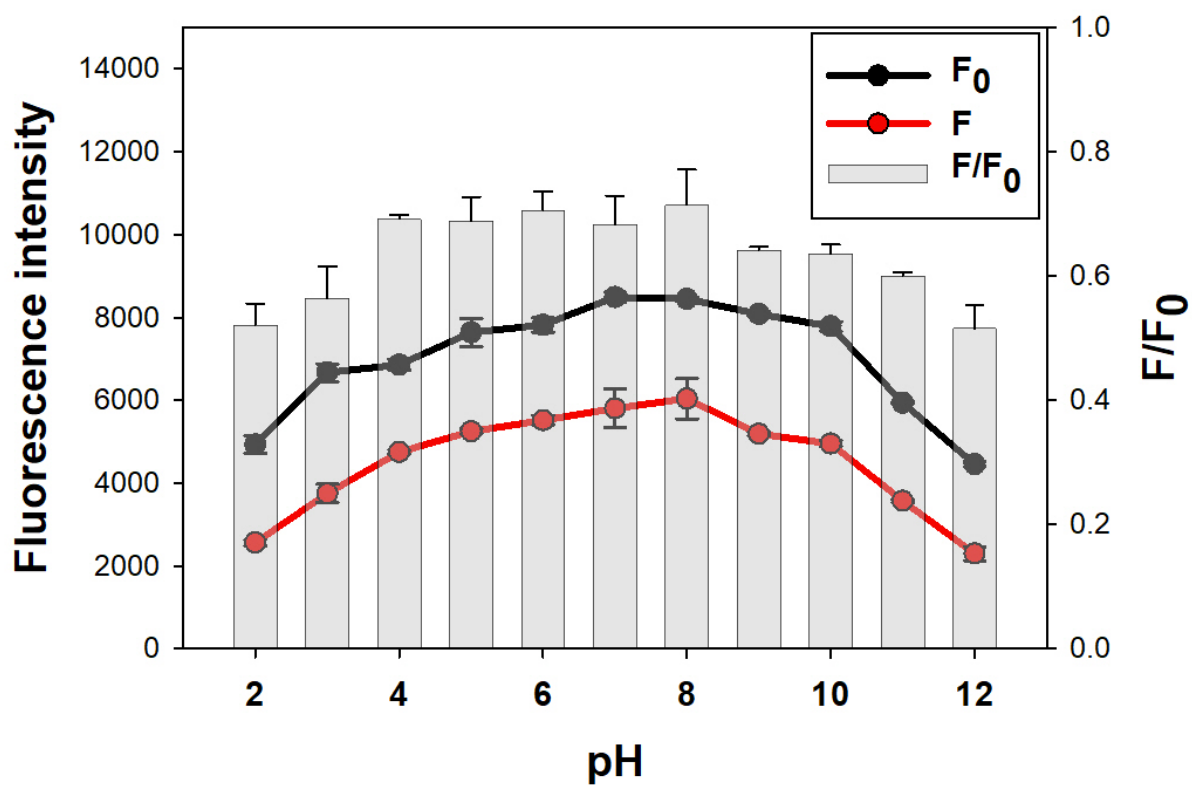
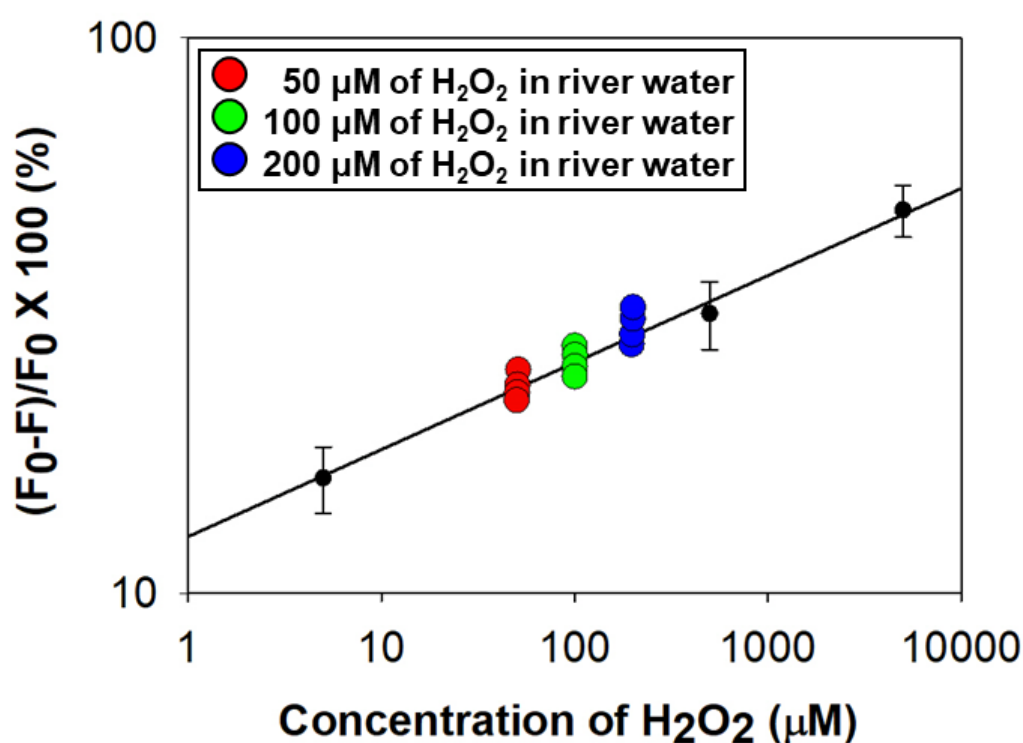


Figure S5. Influence of pH on the detection of  $\text{H}_2\text{O}_2$  using HEFBNPs ( $n=3$ ).



**Figure S6.** Comparison of results from HEFBNPs analysis using real river water with calibration curve that conducted by experimental condition ( $n=4$ ). When the real sample analyzed, the condition as follows; 20 °C, pH 7,  $F_0$  = Fluorescence intensity when HEFBNPs mixed with blank river water,  $F$  = Fluorescence intensity when HEFBNPs mixed with river water containing known concentration of  $\text{H}_2\text{O}_2$ . River water samples containing known concentrations of  $\text{H}_2\text{O}_2$  were artificially made with final concentration of  $\text{H}_2\text{O}_2$  = 50, 100, 200  $\mu\text{M}$  using blank river water. The fluorescence analyzing method of  $F$  and  $F_0$  were same as manuscript.