Supporting Information

Recyclable fluorescent gold nanocluster membrane for visual sensing of copper(II) ion in aqueous solution

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Figure S1. Optical properties of the as-prepared Au NCs. (A) The photo of an Au NC solution illuminated by white light; (B) The fluorescent photo of the Au NC solution under UV light excitation (365nm). (C) UV-Vis absorption and fluorescence spectra obtained for the Au NC solution.
**Figure S2.** The photos for a piece of fluorescence gold nanoclusters membrane (FGM) obtained by drying Au NC suspension at 90 °C. (A) The photo was taken under a white light. (B) The photo was taken under a 365 nm UV light.

**Figure S3.** The photos of FGM-based sensors using FGMs of various thicknesses: (a) 67 μm; (b) 100; (c) 133 μm; (d) 167 μm. The photo was taken under 365 nm UV light.
**Figure S4.** The photos of eliminating the interference of Hg$^{2+}$ in detecting Cu$^{2+}$ by Au NCs. (A) The fluorescence of Au NCs in the presence of Hg$^{2+}$; (B) The fluorescence of Au NCs in the presence of Cu$^{2+}$; (C) The fluorescence of Au NCs in the presence of Sn$^{2+}$ and Hg$^{2+}$; (D) The fluorescence of Au NCs in the presence of Sn$^{2+}$ and Cu$^{2+}$. The photo was taken under 365 nm UV light. The concentration of metal ions: [Hg$^{2+}$]=5×10^{-5}$ M; [Cu$^{2+}$]=10^{-3}$ M; [Sn$^{2+}$]=10^{-3}$ M. The pH value of the acetate buffer solution is 6.
Figure S5. The calibration curve of the FGM sensors at pH 6. The fluorescence inhibition ratio (F0/F) was measured under various concentrations of Cu^{2+} (from bottom to top): 0, 10, 30, 50, 75, 100, 200, 300, 400, 500 µM). The error bars represent the standard deviation in three measurements.