

Supplementary information

**Optimization of aptamer-triggered hybridization chain reaction for rapid visual
ATP detection using gold nanoparticles**

Shengli Zhou,^a Hiroko Fukaya,^a Shunsuke Watanuki,^a Wei Liu,^a Maasa Yokomori,^a Muneyuki Matsuo,^{a,c} Kazuya Okada,^b Yukina Yoshioka,^b Keitaro Yoshimoto,^{*a}

^a Department of Life Sciences, Graduate School of Arts and Sciences, The University of Tokyo, 3-8-1 Komaba, Meguro, Tokyo, 153-8902, Japan

^b Daikin Industries, Ltd., 1-1 Nishi-Hitotsuya, Settsu-shi, Osaka, 566-8585, Japan

^c Graduate School of Integrated Science for Life, Hiroshima University, 1-3-1 Kagamiyama, Higashi-Hiroshima, Hiroshima, 739-8526, Japan

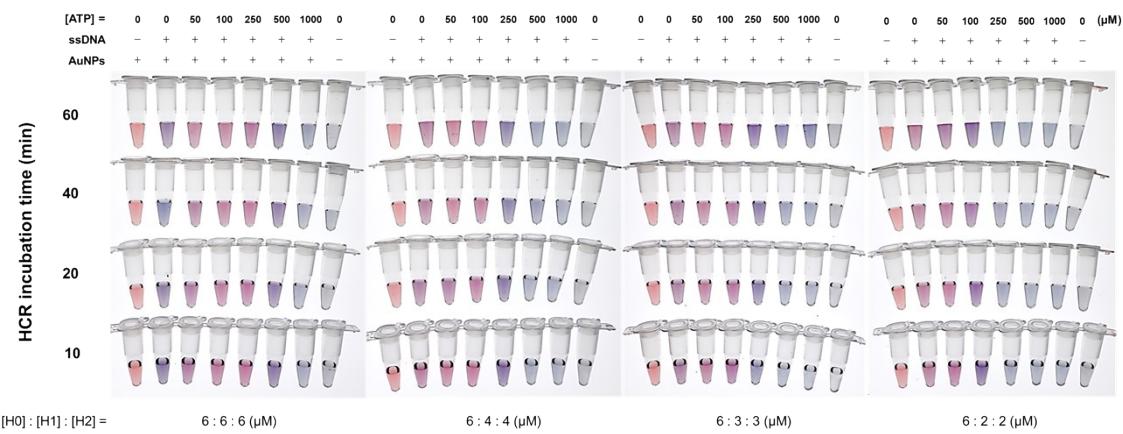


Figure S1. ATP concentration dependences in the color development of AuNPs at different concentration ratio of H0, H1, and H2 after different concentration HCR incubation time. These color changes were observed 5 min after mixing the HCR product with AuNP solution at 25 °C. Mixing conditions: 60 μ L of AuNP solution with 4 μ L of HCR solution. HCR was carried out under the experimental condition as follows; $[\text{MgCl}_2] = 10 \text{ mM}$, $[\text{NaCl}] = 300 \text{ mM}$. Similar results were obtained in three independent experiments.

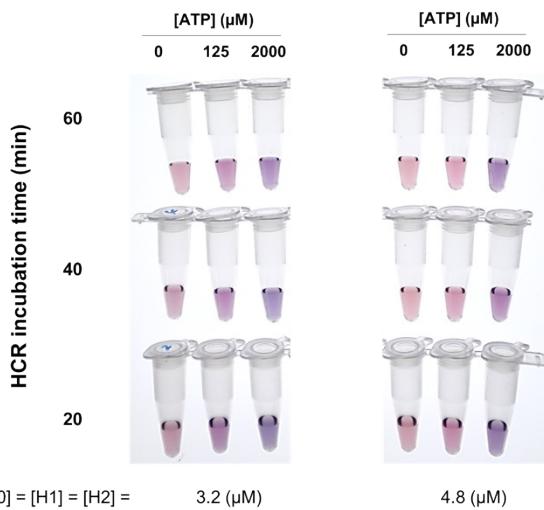


Figure S2. ATP concentration dependences in the color development of AuNPs at different concentration ratio of H0, H1, and H2 after different HCR incubation time. These color changes were observed 5 min after mixing the HCR product with AuNP solution at 25 °C. Mixing conditions: 40 μ L of AuNP solution with 2 μ L of HCR solution. HCR was carried out under the experimental condition as follows; $[\text{MgCl}_2] = 10 \text{ mM}$, $[\text{NaCl}] = 300 \text{ mM}$. Similar results were obtained in three independent experiments.

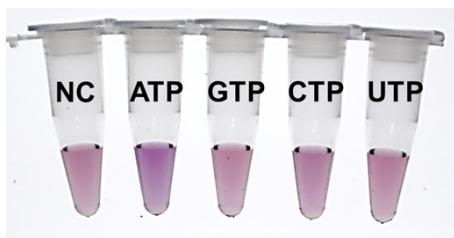


Figure S3. Specificity evaluation of the rapid visual ATP detection system. HCR was performed for 10 min at 25 °C under the following condition; $[H_0] : [H_1] : [H_2] = 6 : 2 : 2 \mu\text{M}$, $[\text{NTPs (ATP, GTP, CTP and UTP)}] = 100 \mu\text{M}$, $[\text{MgCl}_2] = 10 \text{ mM}$ and $[\text{NaCl}] = 300 \text{ mM}$. A no-NTP condition was used as negative control (NC). These color changes were observed 5 min after mixing the HCR product with AuNP solution at 25 °C. Mixing conditions: 60 μL of AuNP solution with 4 μL of HCR solution. Similar results were obtained in three independent experiments.