

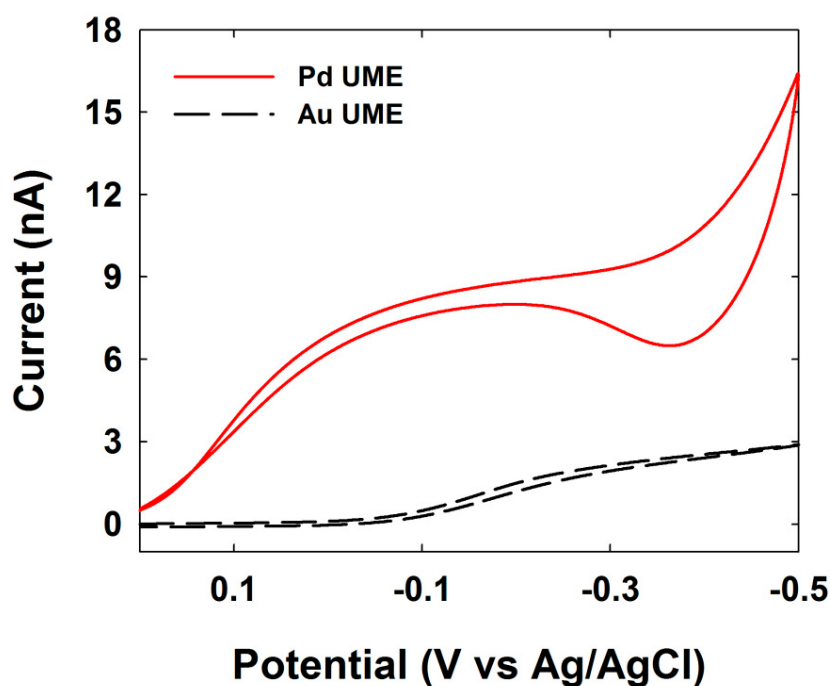
## Supporting Information

# Chronoamperometric Observation and Analysis of Electrocatalytic Ability of Single Pd Nanoparticle for Hydrogen Peroxide Reduction Reaction

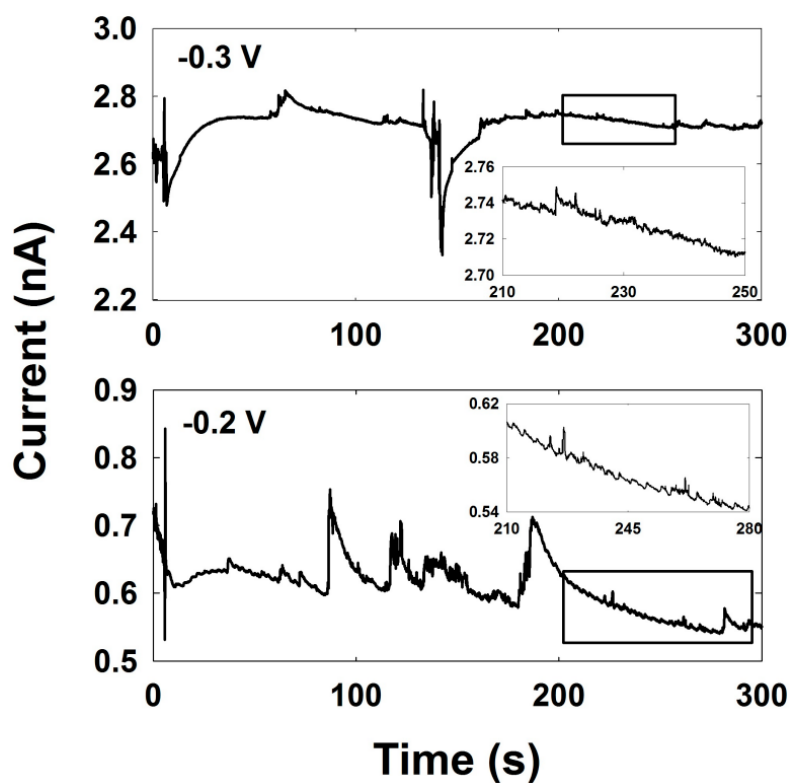
June Young Park, Ki Jun Kim, Hyeryeon Son and Seong Jung Kwon\*

Department of Chemistry, Konkuk University, 120 Neungdong-ro Gwangjin-gu, Seoul 143-701, Korea; pa7673rk@naver.com (J.Y.P.); kim573252@naver.com (K.J.K.); envy5255@daum.net (H.S.)

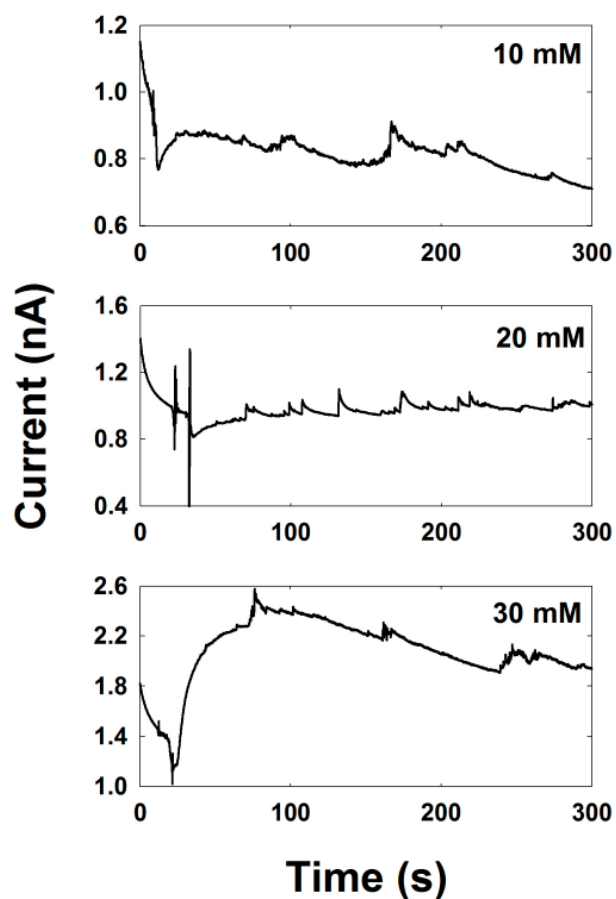
\* Correspondence: sjkwon@konkuk.ac.kr; Tel.: +82-2-450-0429



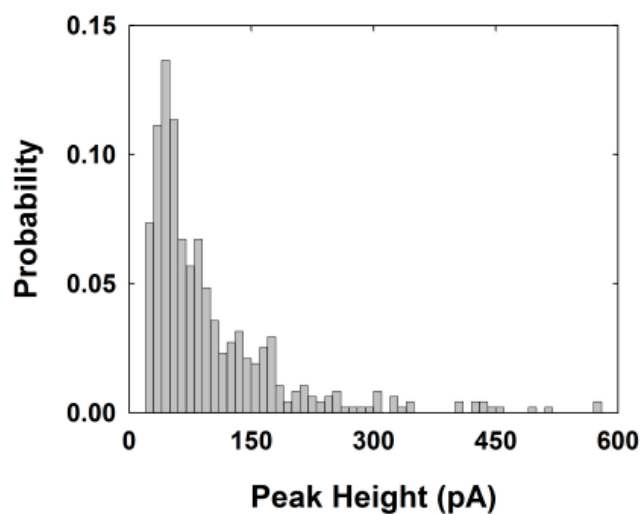
**Figure S1.** Cyclic voltammograms of background reaction at Au (black dashed) or Pd (red solid) UME (radius 6.35 and 10  $\mu\text{m}$ , respectively) in a 0.1 M PB solution (pH 6.8) without  $\text{H}_2\text{O}_2$ , Scan rate was 100 mV/s.



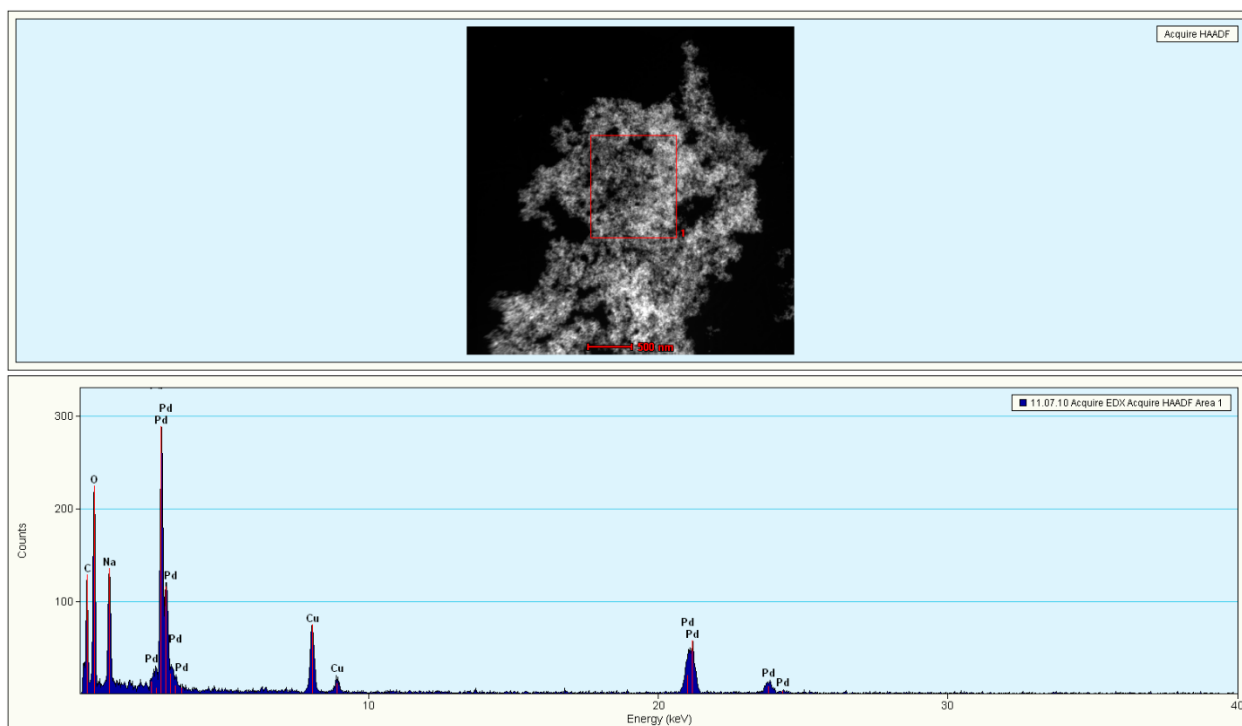
**Figure S2.** Chronoamperometric curves for single Pd NP collisions at an applied potential of  $-0.3\text{ V}$  (top) or  $-0.2\text{ V}$  (bottom) at the Au UME with  $10.5\text{ pM}$  of Pd NP concentrations in a  $0.1\text{ M}$  PB solution containing  $10\text{ mM H}_2\text{O}_2$ . The data acquisition time was  $50\text{ ms}$ .



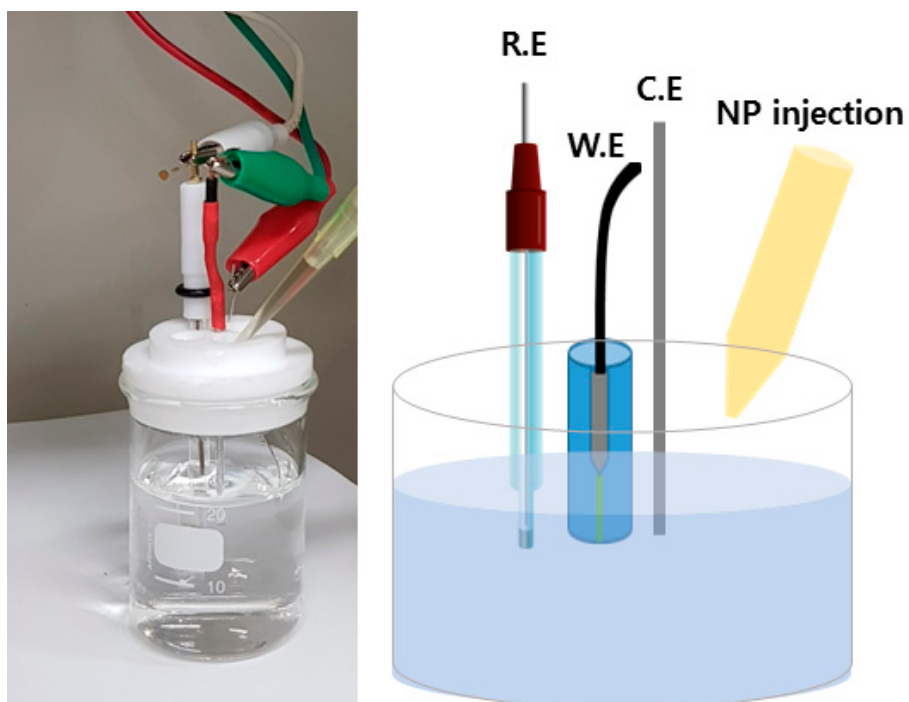
**Figure S3.** Chronoamperometric curves for single Pd NP collisions at -0.15 V applied the Au UME with 10.5 pM of Pd NP concentrations in a 0.1 M PB solution containing various H<sub>2</sub>O<sub>2</sub> concentrations (10 mM, 20 mM, and 30 mM).



**Figure S4.** Distribution of current height of single Pd NP collision.



**Figure S5.** TEM image of Pd NP and its energy-dispersive X-ray spectroscopy (EDX) analysis. The scale bar is 500 nm.



**Figure S6.** Photo of electrochemical set-up and its schematic illustration.