

Supporting Information for

Visual Electrochemiluminescence from an All-Solid-State Electrochemical Cell

Wenlong Wang^{a†}, Haiyu Fang^{a†}, Yufei Deng^a, Dechen Jiang^b and Danjun Fang^{a*}

a. School of Pharmacy, Nanjing Medical University, Nanjing, Jiangsu 211126, China

b. State Key Laboratory of Analytical Chemistry for Life Science, School of Chemistry and
Chemical Engineering, Nanjing University, Nanjing, 210092, China

†These authors contribute equally.

Email: djf@njmu.edu.cn

Experimental section.

1.1 Materials and reagents.

L-012(8-Amino-5-chloro-7-phenylpyrido [3,4-d] Pyridazine-1,4(2H,3H)-dione) is from Wako Chemical (Japan). Polydimethylsiloxane (PDMS silicone rubber) from Dow Corning (USA). AM(Acrylamide), HEA(hydroxyethyl acrylate), PEGDA(polyethylene glycol diacrylate) and 2-hydroxy-2-methyl-1-phenylacetone are all from Sigma-Aldrich. Hydrogen peroxide is from Aladdin (Shanghai, China),.

1.2 Assemble of all-solid-state electrochemical cell

The all-solid-state electrochemical cell is assembled by two ITO slides and a hydrogel as the solid electrolyte. The hydrogel is prepared from a monomer with 50 wt% AM, 20 wt% HEA, 30 wt% PEGDA and 500 mM KCl. L012 and hydrogen peroxide is added into the monomer with the ratio of 2:1:1 (V:V) as the ECL components. 2-hydroxy-2-methyl-1-phenylacetone as the photoinitiator is added into the monomer with a content of 1 vol%. The ITO slides with the mixture are exposed to 50 W ultraviolet light for the polymerization. After several minutes, the hydrogel is formed to obtain all-solid-state electrochemical cell.

1.3 Recording of ECL emission from the cell

The ITO slides are connected with a voltage generator or an electrochemical station (CHI 660) to introduce the voltage. The intensity of ECL emission from the cell is recorded by a photomultiplier tube (PMT). The ECL image from the cell is recorded using a simple camera (Sony Alpha 6400)

Figure S1. The ECL intensity from L012/hydrogen peroxide in 10 mM PBS under the voltage.

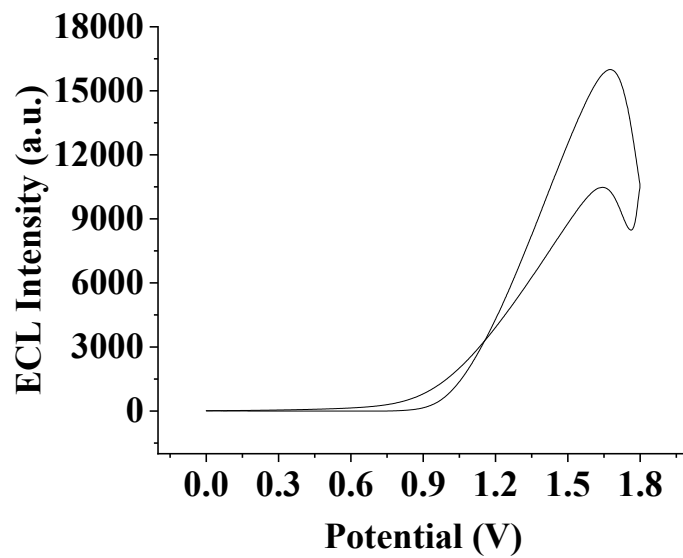


Figure S2. Cyclic voltammety of L012 and hydrogen peroxide in the hydrogel at ITO electrode.

The voltage range is set from -5 to 5 V. The scan rate is 1 V/s.

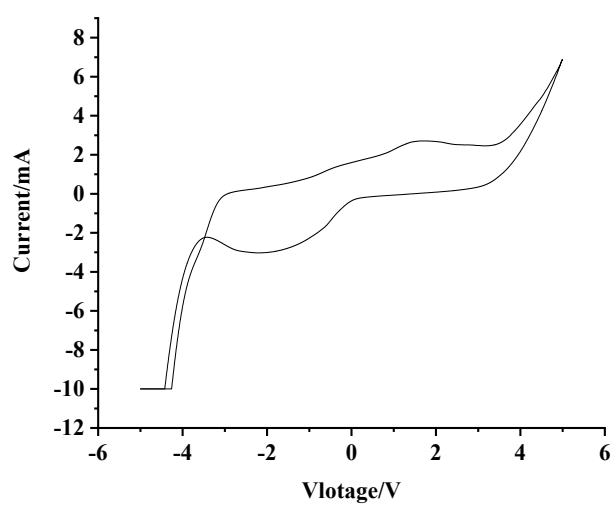


Figure S3. The ECL intensity from the hydrogel with 1 mM L012/1 mM hydrogen peroxide under different voltages from 1 to 5 V. The error bar presents the standard deviation from three independent measurements

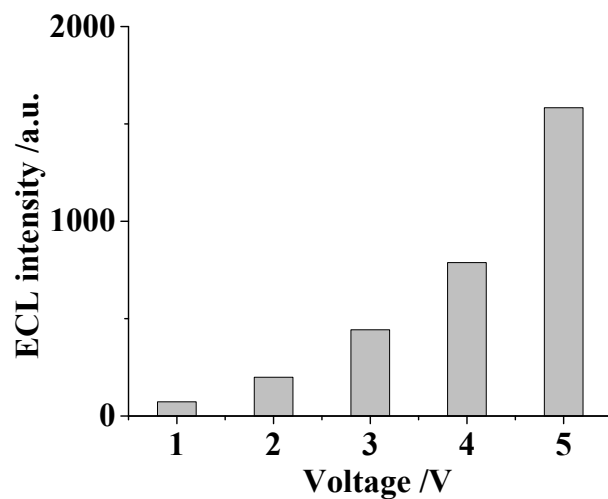


Figure S4. The grey values at the hydrogel in the ECL images under the consecutive 75 electrical stimuli. The voltage applied is (\pm) 1 V.

