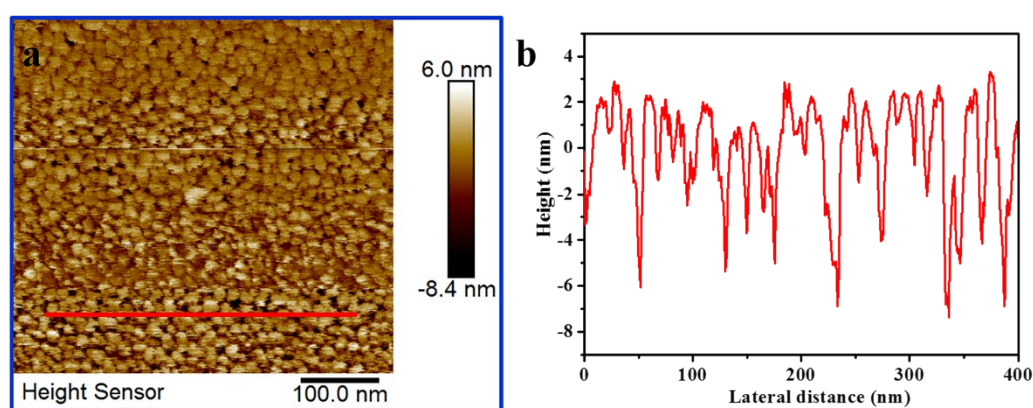


1 **Supporting information**

2 **Photoelectrochemical response to glutathione in Au-decorated ZnO**  
3 **nanorod array**

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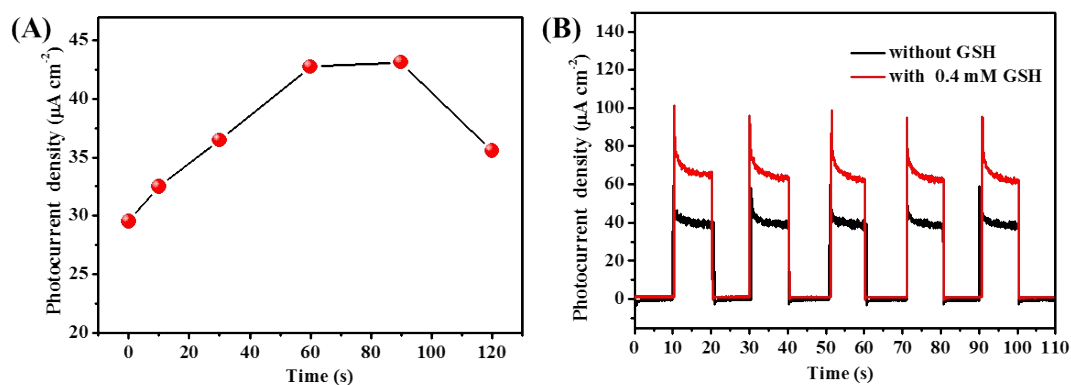
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8 **Fig. S1** (a) AFM image of Au NPs, (b) surface information details of Au NPs from AFM

9

10 The distribution of Au NPs on the surface of ZnO NRs has an impact on the  
11 availability of simulated sunlight and photocurrent response. Previous reports have  
12 indicated that the SPR of gold particles depended on their size <sup>1,2</sup>. And there is a point  
13 at which increasing the particle size ceases to improve the potential sensitivity of a  
14 particle-enhanced assay over the number densities studied. Hence, the different  
15 deposition time from 0 to 120 s was carried out and the photocurrent response increased  
16 at first till 60 s and declined when at 120 s obviously as shown as **Fig.S2 (A)**. Therefore,  
17 the deposition time of 60 s was chosen as the ideal deposition time in the following  
18 studies.

19



20

21 **Fig. S2** (A) Photocurrent response vs deposition time of gold nanoparticles from 0 to 120 s.

22 (B) Time-based photocurrent responses of the PEC sensor under several on/off irradiation cycles.

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**Table S1** Selective detection of GSH by self-powered PEC sensor

Chemical & biological substance	I/I <sub>0</sub> <sup>a</sup> (%)
GSH	100
DA	<1
Glu	<1
Cys	<1
AA	<1
UA	<1
ethanol	<1
Zn <sup>2+</sup>	<1
Na <sup>2+</sup>	<1
K <sup>2+</sup>	<1
Ca <sup>2+</sup>	<1
Mg <sup>2+</sup>	<1
Fe <sup>3+</sup>	<1

25 <sup>a</sup> I/I<sub>0</sub>(%)=[I(interfering substance, μA)]/ [I<sub>0</sub>(GSH, μA)]×100.

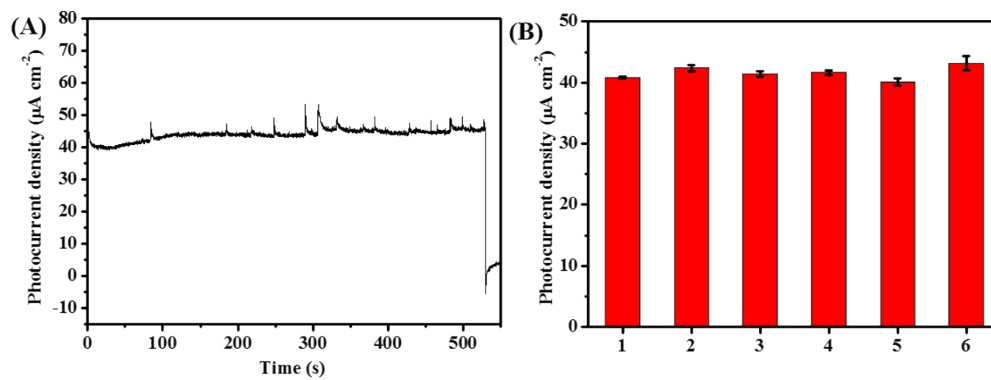
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32 **Fig. S3** The stability (A) and reproducibility (B) of the Au NPs-ZnO NRs/FTO electrodes (n=6)

33

34

### 35 **Reference**

36 1. L. A. Lyon, D. J. Pena and M. J. Natan, *J Phys Chem B*, 1999, **103**, 5826-5831.

37 2. S. Linic, P. Christopher and D. B. Ingram, *Nat Mater*, 2011, **10**, 911-921.

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