Supporting Information to

Highly sensitive detection of rutin in pharmaceuticals and human serum using ITO electrodes modified with vertically-ordered mesoporous silica-graphene nanocomposite films

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S1 XPS characterization of GO/ITO and ErGO/ITO

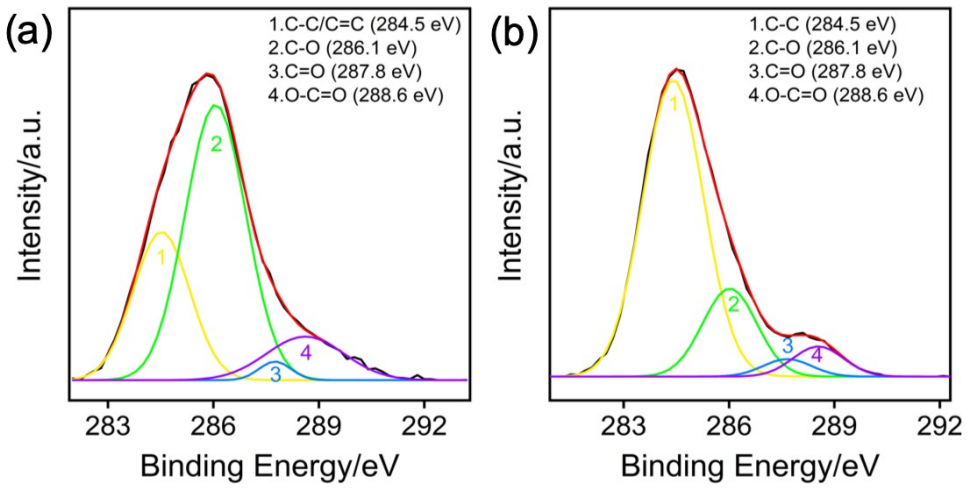

Fig. S1 C 1s XPS profiles of GO/ITO and ErGO/ITO.

S2 EIS characterization of VMSF/ErGO/ITO

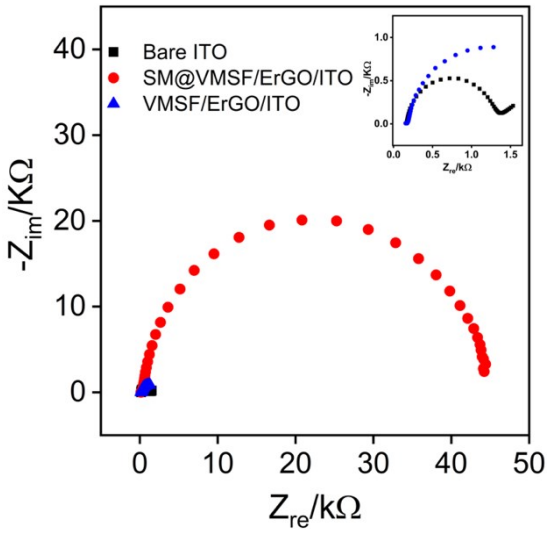

Fig. S2 EIS plots of the Bare ITO, SM@VMSF/ErGO/ITO and VMSF/ErGO/ITO electrodes in 0.1 M KHP solution containing 2.5 mM $Fe(CN)_6^{3-/4-}$ at a frequency of 0.1 Hz to 100 kHz..

S3. CVs of rutin at the VMSF/ITO and VMSF/ErGO/ITO

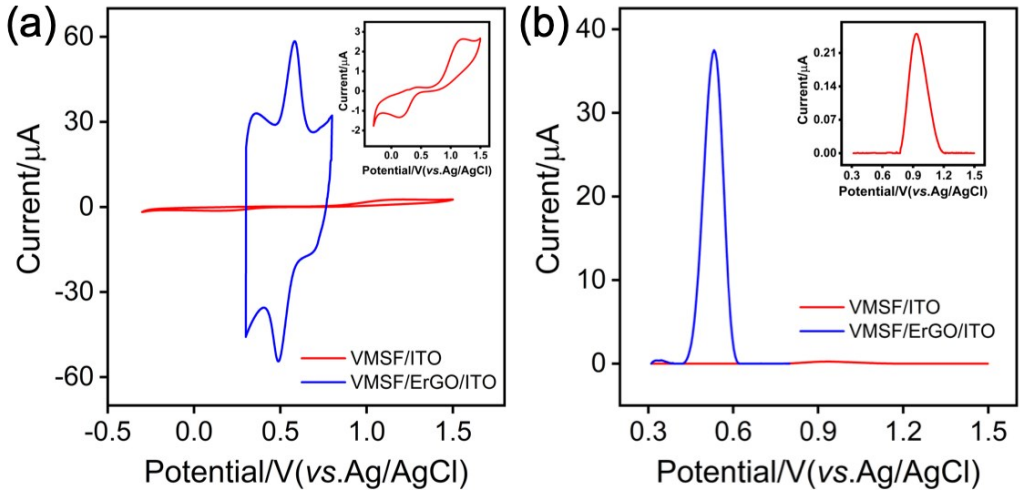

Fig. S3 CVs (a) and DPVs (b) of 30 μM rutin at the VMSF/ITO and VMSF/ErGO/ITO electrodes in 0.1 M PBS (pH = 3). The scan rate for CVs was 50 mV/s and the insets were the corresponding amplified view of the VMSF/ITO electrode.

S4. The effect of scan rate on the CV responses

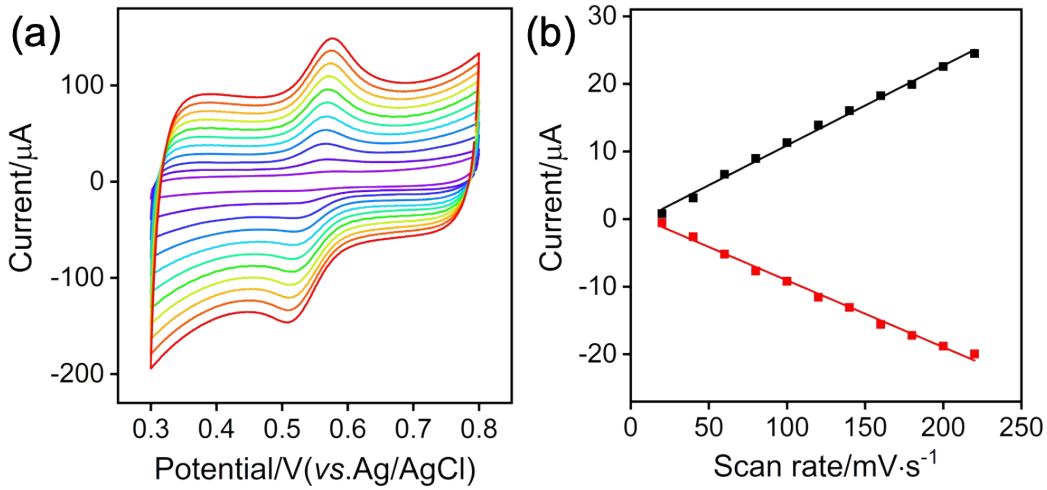

Fig. S4 (a) CV curves obtained from VMSF/ErGO/ITO in PBS (0.1 M, pH 3.0) containing 30 μM rutin at various scan rates. (b) The dependence of anodic and cathodic peak potential on scan rate.

S5. Transmittance spectra of bare ITO and VMSF/ErGO/ITO

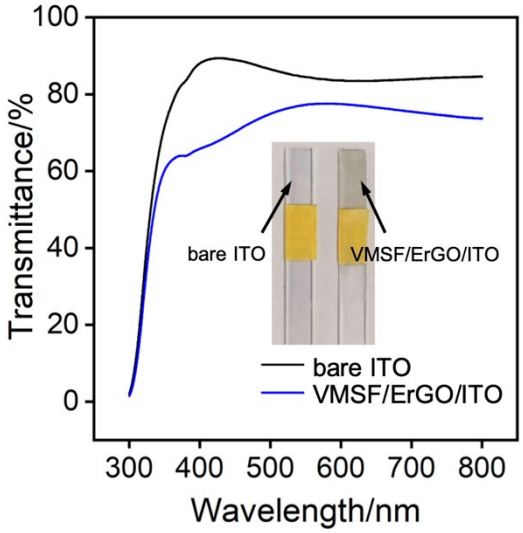

Fig. S5 Transmittance spectra of the bare ITO and VMSF/ErGO/ITO. Inset was the photographs of the bare ITO and VMSF/ErGO/ITO electrode. The concentration of GO used here is 0.1 mg/mL.

S6. Optimized conditions for electrochemical detection

S6.1. The concentration of GO

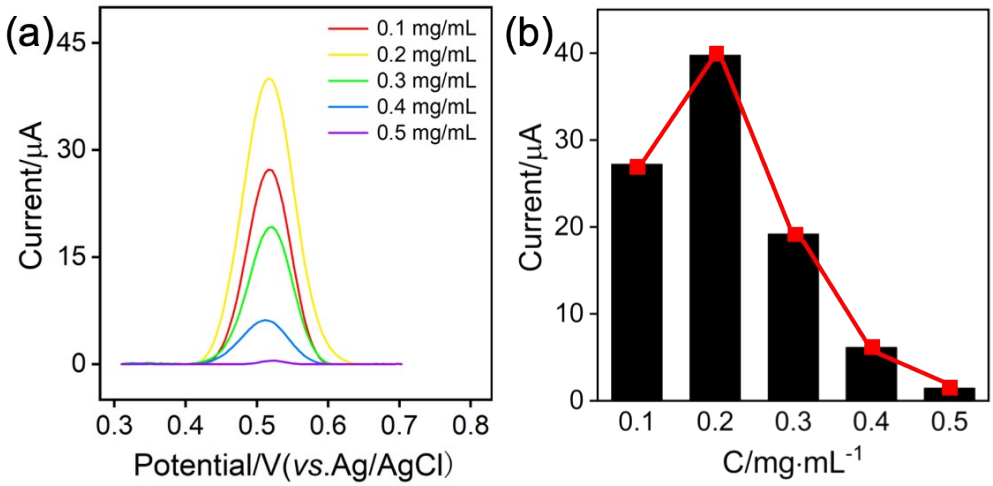

Fig. S6 (a) DPVs of the VMSF/ErGO/ITO electrode prepared by various concentrations of GO in a 0.1 M PBS (pH=3) solution containing 30 μM rutin. (b) The dependence of anodic peak current on the GO concentration.

S6.2 pH of supporting electrolyte

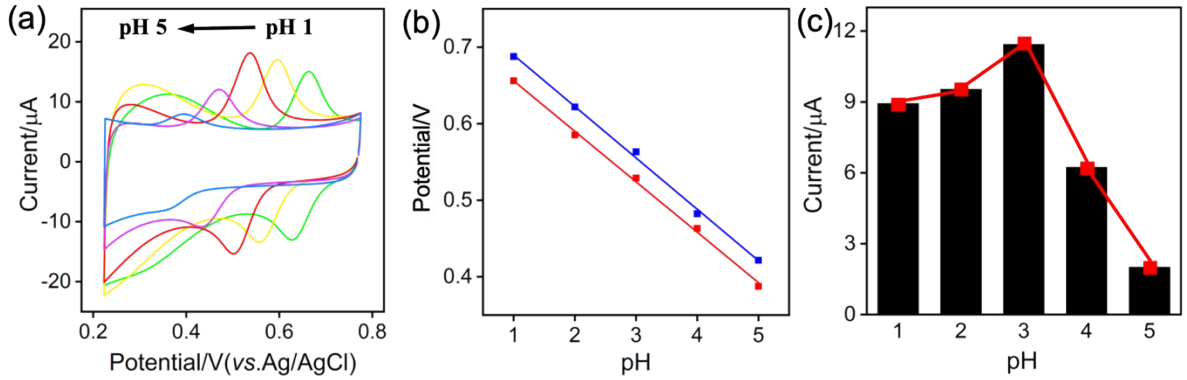

Fig. S7 (a) CVs of the VMSF/ErGO/ITO electrode in a 0.1 M PBS solution containing 30 μM rutin at various pH values. (b) The dependence of cathodic peak potential (E_{pc}) and anodic peak potential (E_{pa}) on the pH value. (c) The dependence of anodic peak current on the pH value.

S6.3 Preconcentration time

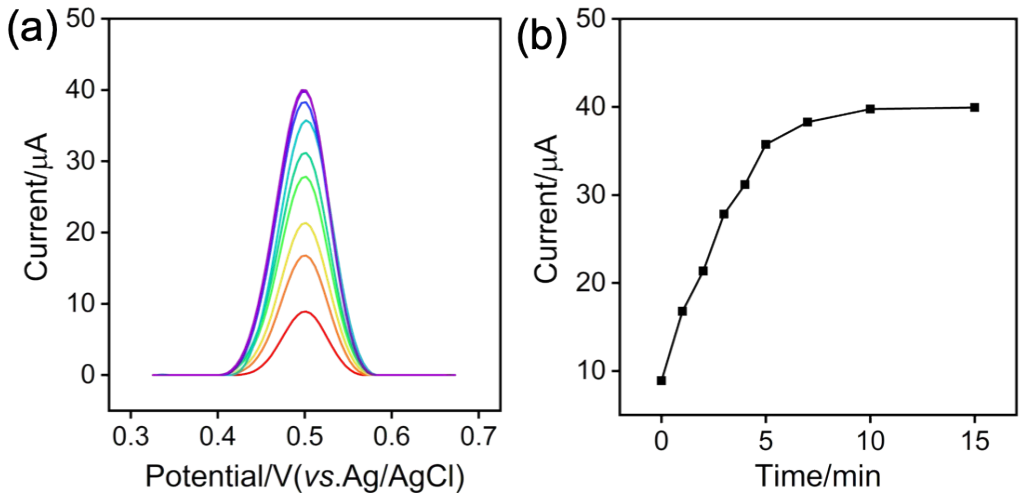

Fig. S8 (a) DPVs of the VMSF/ErGO/ITO electrode in a 0.1 M PBS (pH=3) solution containing 30 μM rutin at different accumulation time. (b)The dependence of anodic peak current on the accumulation time.

S7. Anti-interference study of the VMSF/ErGO/ITO

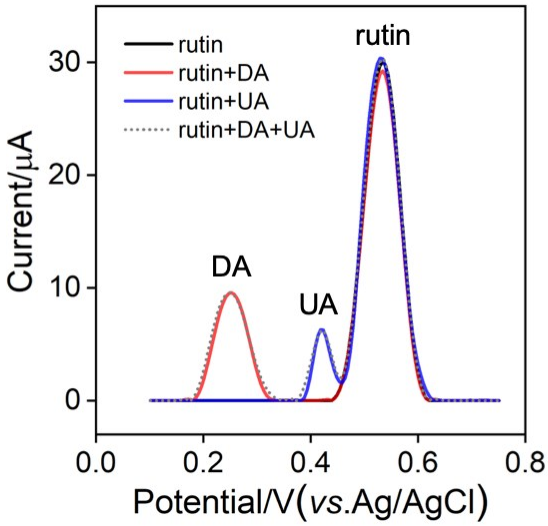

Fig. S9 DPVs of the VMSF/ErGO/ITO electrode in a 0.1 M PBS (pH=3) solution containing 20 μM rutin in the absence and presence of 40 μM DA or/and UA.